



TANGANYIKA TERRITORY.

DEPARTMENT OF AGRICULTURE

Annual Report

1928/29.

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DAR ES SALAAM
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TANGANYIKA TERRITORY.

DEPARTMENT OF AGRICULTURE ANNUAL REPORT 1928/29.

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DEPARTMENT OF AGRICULTURE.

REPORT FOR 1928/29.

For convenience this Report is now divided into two parts: Part I dealing with Agricultural Administration and Progress, and Part II with Agricultural Investigation that has been carried out during the period.

STAFF.

1. During the year five more appointments as District Agricultural Officer were filled, bringing the number of these officers up to the twenty provided for so far. This makes six officers in the Department, now, who have had the advantage of the teaching and training afforded by the Imperial College of Tropical Agriculture, Trinidad; and in future, with special exceptions where plantation and factory experience with certain crops (such as tobacco and tea) are required, it will be the aim that all District Agricultural Officers appointed shall have been through the College. The advantage of this, in increasing the equipment of such officers for their work and saving time in their training in the Territory, cannot be over-estimated. One of the new appointments in this grade was that of an officer for the South-Western Area with special training and qualifications in tobacco-growing; so that there are now two officers (one in Songea) at the disposal of the Department with such training. It was not possible during the year to find the officer, that it was intended to provide, with good qualifications in tea; in accordance with the policy of the Department, time will not be grudged that is required for getting a good man for the post.

2. With the aid of the Empire Cotton Growing Corporation, two Cotton Investigators were appointed, both of whom have had experience of investigational and other work with cotton under the Corporation, one in Egypt and the other in South Africa. Time is required for the work of these officers to have its effect in improving the Territory's cotton as regards its well-maintained quality and (what is equally important) establishing regional cottons of the upland type which will possess well-established characters and uniformity.

3. At the end of the year it had not been possible to find an Officer to take the more direct charge of the economic work with plants that the growth of agriculture in the Territory and the work already begun in the Department are making of so great urgency. As recognized and emphasized by the Empire Marketing Board, the requirements of the New Agriculture, with its insistence on adequate investigation before development, and its quality of definiteness, necessitate the possession of an Economic Laboratory with staff equipment of the proper quality

by every Agricultural Department. Efforts for finding a good man for the post are continuing; and close contact with the Appointments Branch of the Colonial Office is being maintained for the purpose.

4. With changes due to termination of appointments, three Agricultural Assistants for coffee and four for ploughing and general instruction were provided. The work of the former, for assisting in the protection of the coffee industry alone, has attained an importance that in itself well justifies their provision.

FINANCE.

5. The total provision for the direct work of the Department increased from £38,366 in 1928-29 to £43,782, the sums of £24,851 and £28,114 being in respect of Personal Emoluments and of £13,515 and £15,668 for other charges in each case. The total provision for the European Administrative, Scientific and Field Staffs was £18,743, the respective percentages of this being 25, 16 and 59. This provision is in accordance with the policy of the Department, whereby attention is first given to the supply of an adequate field staff for aiding the planter and native farmer, the administrative and scientific staffs being increased as the development, partly arising from the work of the field staff, of the agriculture of the Territory takes place. The scientific staff budgeted for so far comprises that for plant protection (Entomologist, Mycologist and Assistant Entomologist) and cotton-breeding; but the needs of the planter and native farmer have become such that the addition of an Agricultural Economist, and a Plant Breeder as the work of the former develops, has become necessary.

6. Provision for indirect aid in connection with the work of the Department amounted to £8,778 in the Department's Estimates for contributions to the East African Meteorological Service, Colonial Office Agricultural Scholarship Scheme, Imperial Bureau of Mycology, East African Agricultural Research Station (£6,000) and the Council of the Colonial Agricultural Research Service. Similar provision was also made by a contribution (£300) to the Imperial Bureau of Entomology and to the Imperial Institute (£100) under Miscellaneous Services.

GENERAL AGRICULTURAL ASSISTANCE.

7. It is usual to imagine that there is a definite boundary between what is done in agriculture for planters and for native farmers; but this is not the case, nor is it advisable or possible that such a condition should exist, although the division is made artificially for convenience. The development of planting that is so assisted increases the demand for labour and thus enlarges the resources of the native, at the same time improving his own agriculture by enabling him to participate in orderly methods. Direct help to native farmers on the other hand enables them to give adequate care to the cultivation and sanitation of their crops (thus protecting perennial crops in a particularly important way), increases and improves the supply of readily available foodstuffs for estates, and makes the labourer a more instructed and useful man when he

offers his services for estate employment. Agriculturally the interests of the planter, native farmer and labourer are identical; and the increased prosperity of any of them means larger revenue for assisting the agriculture of them all.

8. It is likely that there will always be a large and increasing demand for the luxuries tea, coffee and tobacco; and it is fortunate for existing and prospective planters that the country offers areas that are suited to these, although there does not appear to be room left for any large extension of coffee-planting for continued commercial success. The Agricultural and Pastoral Survey (or Land Development Survey) that had by the end of the year been completed by Government over a large part of the South-Western Area (Iringa) has already given information of outstanding usefulness to planters and intending settlers in regard to the possibilities of the first two of these crops and of mixed farming with tobacco. The circumstance that tea and tobacco are entirely new in the country as regards development for significant export production has led to the provision for the assistance of planters of an officer with special knowledge and training in tobacco, to be followed as soon as possible by a similar officer for tea. The work of the Department for plantation coffee has been mainly in the established areas of Kilimanjaro, Meru and the Usambaras, where a scheme of co-operative experimentation has been introduced with (it is regretted) little success. As with tea and tobacco, planters are being assisted by the Department with other undeveloped products that show promise, among them being tung oil (Aleurites), mulberry silk, cinchona (for quinine) and essential oils.

9. It is regretted that there has been little opportunity so far for the Department to assist with sisal the premier agricultural product of the Territory, except in regard to its few pests and diseases. It is the fashion to take for granted the existence of this in a healthy condition, both economically and sanitarily. This precarious attitude must, however, be abandoned, unless we are continually to run the risk of most serious capital loss, added to the social dislocation of a large discharge of labour that becomes less easily absorbed into its original society as time goes on, through failure by experiment and research to arm ourselves with the knowledge of the most economical means of its manufacture and cultivation. The sisal industry has become of so great and intimate importance to the Territory that (as planters in the Netherlands East Indies have realized already) nothing should be omitted for increasing and ensuring as far as possible its stability.

10. Products not yet mentioned that might well receive consideration by planters for co-operative action are wattle and flax. Farming regions at highland altitudes usually present a variety of conditions that include areas little suited to ordinary crops but which would grow wattle, for disposal of the bark at a central factory. The case of flax is more uncertain, especially where there is no railway for exporting; but conditions should be more suitable climatically than those of Kenya, particularly in the less arid parts of the south-west of the Territory, where the bleaker and mistier climate is more favourable than that nearer the equator.

11. At the end of the period under review three pamphlets respectively on Diseases of Crops, Tea and Arabian Coffee, and a report on Tea Prospects in the Southern Highlands, had been issued under the care of the Department for the information and use of planters and settlers. The pamphlet and report on tea were compiled by Mr. M. F. Bell, of Mbangulu Estate, Usambara, who has had long experience of the crop. As regards other kinds of publication, the Department was again indebted to the press of the Territory for making public articles prepared by it with the direct object of affording prompt assistance to planters by rendering available to them information from world-wide sources regarding crops, cultivation and methods of production that are of first interest to them. The number of press articles communicated in this way was 132. An official Agricultural Journal for East Africa is urgently wanted, for this purpose alone. There is no doubt that the extent of the advice and help given to the planting interests of the Territory by means of such publication and by letters of advice and personal contact is not realized. Of the communications sent out during the year no less than 1,047 were addressed directly to planters from Headquarters, the Entomologist and Mycologist and from the District Stations; 368 visits of advice and inspection other than those for native agriculture are recorded as having been paid by District Agricultural Officers outside Headquarters; and at Headquarters the number of unofficial and official visits of enquiry were no less than 189 and 52, respectively.

12. Owing to the existing state of development of agriculture in the Territory, the Agricultural Stations at Morogoro, Mpanganya (Rufiji) and Ibadakuli (Northern Tabora) are necessarily used at present chiefly for work connected with native agriculture. The Botanic Gardens, Dar es Salaam, continue their useful work of plant introduction and the duties of control of trials in connection with this in the parts of the country best suited to the plants introduced. The investigations of fibre plants and plants for green manuring and fodder have also been continued in the Gardens. All this work has special importance in relation to plantation agriculture and the increase of the resources of the Territory. In accordance with the arrangement by which this Report is now issued in two sections dealing with administration and investigation respectively, the reports on this work in stations and gardens are included in the latter, for ready reference by those in other parts of the world who are not directly interested in this record of administration and progress. As regards new Agricultural Stations that are projected, these are intended to be in the Lindi Province, to include work with sisal; and in the Northern Province, to deal with coffee only.

13. As the system of Native Administration in the Territory is strengthened, so the agricultural work among natives gains force and efficiency. The extension of the activities of the Agricultural Officer and the Agricultural Station through agricultural sub-stations (including plant nurseries) belonging to the Native Administration, or in the less developed areas assisted from agricultural funds, and through school gardens, has now become stable and the present most important feature

of agricultural assistance. There is an end of the mere wandering diffuse effort of officers, preaching the agricultural gospel without any means for decentralization with concentration for demonstration propaganda and the equally important work of distribution of tried and select planting material. In former reports the work in the sub-stations was detailed under the different provinces; but its increase would now make such a method of record involved and unhandy for reference, so that the particulars of the activities relating to teaching and improvement of crops through sub-stations are now summarized as Appendices I and II (under names of Provinces) of the Report, entitled respectively: "Sub-stations and their Work," and "Distribution of Planting Material."

14. The valuable assistance given by the British Cotton Growing Association in the provision of a pioneer ginnery in Biharamulo, Bukoba, has enabled useful preliminary progress to be made for endowing a backward tribe, isolated until recently, with a money-crop; and it is hoped that this assistance will be extended to Ufipa-Rukwa (primarily for assistance in the sleeping sickness areas) and Songea. Of much importance to both estate and native agriculture is the progress that is being made with the aid of the Silk Advisory Committee of the Imperial Institute for establishing the mulberry silk industry already mentioned: progress that is to be assisted by a visit by a Silk Expert for investigation and instruction, and the provision of a silk laboratory at Morogoro Agricultural Station. As regards the instruction of natives through the printed word the vernacular paper *Mambo Leo* and the leaflets in Swahili issued by the Department continue their usefulness; in the former ten articles were published, and the series of leaflets was increased to eight by two: one on Coconuts and Copra (in Swahili in both Roman and Arabic characters) and the other on a New Beehive designed to exploit the wild bee without its destruction.

DETAILS OF ASSISTANCE AND PROGRESS.

15. The varying conditions and consequently diversified agriculture of the Territory make it impossible to include the different activities in a general account of agricultural assistance. The more detailed information is therefore given below, under the names of the Provinces, together with the account of general progress by which it is naturally accompanied.

Central Province.

16. The ploughing schools promised in the last Report were opened at SINGIDA and DURUMO, the latter for the area of the Iramba Plateau; and the demonstrations at these are being extended through the sub-stations. A work that should prove of first importance in this and the Tabora and Mwanza Provinces has been begun in the selection of different types of the already acclimatized strains of groundnuts in order to obtain a pure line or lines that flourish and yield best under the particular conditions. Of all the millets that were tried, including Feterita from the Sudan and American Proso millets, the native short-season Bonganhilo still maintains its superiority (as in other parts of

the Territory), and like Potchefstroom Pearl among maize, is increasing quickly in popularity. The best beans so far are a cowpea from Morogoro, Lima beans and the Tepary bean from Arizona, the last of which has frequently given a useful yield with very little rain; whilst soybeans continue to fail. Wheat gives results that are too uncertain for a crop for natives. The importation of cassava by the Department has been very successful in this generally semi-arid area, and thousands of cuttings raised from the original sets are being regularly planted by native farmers. These are following to a growing extent the demonstrations at the sub-stations of the usefulness of frequent cultivations in the dry conditions of their region. An increasing number of farmers, too, now cultivate a greater diversity of crops and are extending sweet potatoes and rice in the scattered areas suited to these.

17. The fodder and forage plants and trees introduced from several of the dry-land regions of the world do not yet in most cases show any great measure of success; and experience is demonstrating that, as in the case of other introduced or select indigenous crops, the assistance of an agricultural station is necessary to these. Of the perennial crops that are receiving attention, date palms from Iraq are succeeding, whilst attempts to raise nursery robusta coffee on the Iramba Plateau have so far failed.

18. The provision of new markets in the area, especially for its staple product groundnuts, will be the best incentive to increased production; and the Provincial Administration is giving attention to this.

Northern Province.

19. The Officers employed directly under the Senior Agricultural Officer, North-Eastern Circle, were a District Agricultural Officer and two Agricultural Assistants for coffee; and towards the end of the period another District Agricultural Officer was provided in order to free the former for giving his sole attention to the chief crop of the area, coffee. As shown in Appendix I the work for native crops, described in paragraph 9 of the last Annual Report, continued to be carried out, the principal increases for distribution being with maize, beans and potatoes; whilst Faya rice was introduced in PARE and trials were made at the higher-altitude sub-stations with lentils. New sub-stations were opened and projected at KAHE and on KILIMANJARO (high and medium level) respectively. The increased cultivation of the select and improved crops introduced by the Department and the greater use of hand farming machinery and better implements, as described in the last Annual Report, have become a stable feature of native agriculture, and require no detailed description.

20. As regards the native coffee industry and its supporting Association, the District Agricultural Officer for Coffee reports as follows: "The Kilimanjaro Native Planters' Association have still further advanced in the management of their own affairs, so that not only do they arrange the marketing of coffee but have provided their own graders who have been taught by the Agricultural Department. The spraying

of coffee for the control of pests and diseases is being facilitated by arrangements for local spray-mixing centres and the purchase of further supplies of poisons. Teaching the use of sprayers and the mixing of sprays according to formula has continued until the Association through its local executives are able to combat the usual and more important coffee pests that occur. Outbreaks of antestia bug and green scale have thus been brought under control during the year." Although the Association had arranged for all their coffee to be sold in London there is an increasing tendency on the part of members to sell outright locally; so that it is difficult to obtain figures of actual production. Shipments and known purchases were as follows, but the figures are much lower than those of even conservative estimates of the crop:—

| | 1st Quality | 2nd Quality | Buni | Known Totals, 1927/28 | | Known Totals, 1928/29 | |
|-------------------|----------------|----------------|-------|--------------------------|-------------------|--------------------------|-------------------|
| | Lb. | Lb. | Lb. | Cwts. | Local Value, £ | Cwts. | Local Value, £ |
| MOSHI— | | | | | | | |
| Shipped | 485,612 | 16,512 | — | — | — | — | — |
| Purchased... .. | 237,666 | 91,055 | 6,000 | — | — | — | — |
| Totals | 723,278 | 107,567 | 6,000 | 7,273 | 36,365 | 7,472 | 37,360 |
| Arusha Totals ... | — | — | — | 728 | 3,640 | 738 | 3,690 |

As in the case of the Moshi crop, no assistance was given by the Department with the marketing of the Arusha native coffee crop.

21. The estate coffee crop on Kilimanjaro and Meru was average in quantity, and ripened especially late through cold weather. The dry, hot conditions of the first months of 1929 encouraged thrips, and many planters who did not spray early suffered significant losses, whilst those who acted with precaution are possessed of healthy coffee promising a fair crop. Figures supplied by the Customs and Railway Departments show that the exports of all coffee from the two areas were as follows in the calendar years indicated:—

| | 1927, cwts. | 1928, cwts. |
|----------------------|-------------|-------------|
| Through Moshi | 38,520 | 26,140 |
| Through Tanga | 11,908 | 19,592 |
| Totals | 50,428 | 45,732 |
| Local value | £252,140 | £ 228,660 |

Of these totals 8,001 and 8,210 cwts. are estimated for coffee of native production. As indicated above, co-operative experiments of the Department with coffee estates have shown little success: they have, however, given so far enough evidence to show that coffee under the existing conditions responds most readily to mulching with grass or the application of farmyard manure, so that the owners of two of the estates on which experiments were conducted were encouraged to extend the use of grass mulch to large areas of them. For this work, the examination of areas for a coffee experiment station was begun.

22. As regards general estate agriculture, 24,094 acres were alienated in Moshi, Arusha and Mbulu Districts, the area in Arusha being 18,084 acres.

23. The District Agricultural Officer, Mr. A. E. Haarer, sent a further consignment of mounted specimens of indigenous plants to Kew for determination, enquiry as to useful species and contribution to herbarium material. The number of herbarium specimens thus submitted by this Officer has now reached 1,600, all of which have been dealt with by Kew.

Tanga Province.

24. As illustrated by the District Agricultural Officer in his report, the varied conditions of agriculture and native tribes in this Province make it particularly interesting from the aspect of work and development. In the Muhesa-Pongwe-Bombwera area of the TANGA DISTRICT, the comparatively dense, detribalised population working largely on the sisal estates and well served with busy markets exhibits a type of cultivation higher than the average, which is concerned chiefly with maize and cassava; and the activities of the Muhesa sub-station are being gradually increased for improving this and the considerable citrus industry of the area, instructors being trained in budding and grafting for the latter. As an additional native perennial crop for the area the oil palm is being encouraged, and it is of interest that experiments for finding the best method of germinating this showed after forty weeks a 30 per cent. germination for a method used in Nigeria (removing the oily outer pulp and soaking in bags in running water for five days before sowing) as against 15 per cent. for a Malayan method (sowing directly in wet sand beds after similarly removing the outer pulp). Trials of vegetable-growing for this area have shown encouraging success; but there is as yet no great appeal by this money crop to natives as the continuous effort needed for it is not popular.

25. In accordance with the policy of ensuring food supplies for native labour and farmers the work in the USAMBARAS has been chiefly for the improvement and extension of food-crops; and the progress begun is reported to be sustained. The distributions of planting material were concerned mainly with Potchefstroom Pearl and White Congo (for the drier areas) maize, beans and vegetables and two-and-a-half tons of potatoes were recovered from recipients of "seed," for a further distribution. For a perennial crop, five communal nurseries of robusta coffee were opened in the Bwiti division of the Eastern Usambaras.

26. Near the end of 1928 the chief cotton-growing areas of PANGANI were transferred to Handeni; so that its interest in cotton has almost ceased, and effort is being concentrated on the production of food for sisal estate labour and farmers, the increase of white simsim (seed specially introduced from Lindi) and sanitation of the coconut areas. For the last a coconut instructor, appointed early in 1928, in five months visited 193 holdings comprising some 30,000 palms, helped to make 227 beetle traps and disposed of 352 dead or diseased palms; no prosecutions of delinquent owners were made, as warnings proved sufficient. The

work in HANDENI continues to be concerned chiefly with food-crops and cotton, with coffee in the Nguru area (now controlled for convenience from the Morogoro Agricultural Office). As showing the dependence of progress in sub-stations on the keenness of the Native Authority, the following is taken from the annual report of the District Agricultural Officer: "Korokura (Mazingara) with a progressive chief behind it has developed from a bush site early in 1928 to a well laid out sub-station which is without doubt the best in the Province, not excepting Muhesa, though its remoteness has only allowed three visits from the District Agricultural Officer during the whole period." At the coffee nurseries in NORTHERN NGURU the demand for seedlings was smaller than the supply, and those remaining were taken over by the chiefs; the distribution was as follows: Lulago nursery 1,638 seedlings to eleven farmers, Kilindi nursery 3,613 to twenty.

27. The beginning of the period saw no school gardens in the whole of the Province except some coconut plots belonging to schools in the coastal area and a cotton plot at Msoto school, Handeni. An organized beginning was made by distribution of seed to all six of the inland schools with the co-operation of the Headmaster, Tanga School, and to three Handeni Schools.

28. In the locust invasion, Muhesa and Mlalo sub-stations were reported to have suffered most: in the former, whilst the citrus stock among the other plants was defoliated, oil palm seedlings and pineapples alone escaped. The chief damage to crops was in the Kilimanjaro-Meru area, Pare, and in the Korogwe and Handeni Districts in which there was risk of serious shortage of food, happily not experienced. The invasion was responsible also for a decrease in the newly established maize exports from Tanga (chiefly through use for food) from 16,976 cwts. in the former year to 4,924 cwts. Consignments of fruit on rail from the Muhesa area, mostly citrus chiefly to Kenya, reached 503 tons in 1928 as compared with 513 tons in 1927.

29. For the assistance of estate agriculture the Department surveyed and partly cleared a Sub-tropical Fruits Station near Lushoto and introduced as green manures among coffee planters in USAMBARA the indigenous *Crotalaria striata*, and *Calapogonium mucunoides* from the East (both first tried in the Botanic Gardens, Dar es Salaam) and Kudzu vine as a forage plant. The existence of a European-owned palm oil factory near Muhesa has encouraged the work for oil palm planting among natives mentioned above, which should eventually assist such enterprise.

30. On three large sisal estates the factories have been equipped with up-to-date machinery including crude-oil burning plant, in order to solve the fuel difficulty, in two cases; and plant and arrangements for rope-making have been introduced on Magungu estate, Korogwe. The opening-up of new areas for sisal, largely through the clearing of derelict Cearà rubber, continues. The estate industry next in importance to sisal, coffee in the Usambaras, suffered through the failure of the August-September rains, yields being reduced by 75 per cent.; so that

consignments on the Tanga Railway from this area were reduced to 2,499 from 8,835 cwts. in 1927-28. The planting of coffee in this region continues slowly: three estates increasing their areas of Arabian and one planting robusta. On Ambangulu and Sakare estates the areas in tea were extended. Estates and Missions near Lushoto continue to be responsible for the chief supply of fresh fruit and vegetables, the average railings from Mombo being about 100 tons a year.

31. The estates in Handeni District are being planted chiefly with robusta coffee and kapok, the latter of which is giving an increased export from the Province: 109 tons in 1928-29 as compared with 73 in 1927-28. An interesting enterprise was begun on Tamota estate: that of the production and artificial drying of the Cavendish banana for export to Europe.

Eastern Province.

32. The work at the two Agricultural Stations in the Province, namely Mpanganya (Rufiji) and Morogoro, is described in Part II of the Report, dealing with work of investigation.

33. Work in sub-stations in RUFJI DISTRICT was begun by the opening of one at Rusende (lowlands) chiefly for rice, where interesting trials of hill-land, marsh-land and intermediate kinds (Unyengwa, Afa and Marula), gave in order 1,360 and 960 kgs. of paddy per acre (Marula was damaged by wild pig), thus duplicating the striking evidence of the Agricultural Station that, contrary to native opinion, hill-land rice grows successfully on lowland soils. A further result causing much local interest was a yield of an average of 960 kgs. of paddy from lined-out plots as compared with 160 kgs. from plots broadcasted in the native fashion. Another arresting result was a yield of Kenya Hybrid maize at a rate of 1,110 kgs. per acre. For the next season two more sub-stations were instituted at Kwangwazi and Mohoro, western and eastern Rufiji, respectively. The ploughing school for coconut owners at Mbwera on the coast showed some success with the Jat plough; but heavier animals are required for the best results; and it was decided to assist the training by means of Departmental instructors from Shinyanga. The agricultural teaching of about eighty boys at the Government School continues to show the outstanding success to be expected from situating such schools at Agricultural Stations; and this success was assisted by working in 1/80th-acre plots for the teaching by enquiry and demonstration, in the place of the mere drudgery that is caused by raising crops in school gardens on large areas chiefly for support or revenue.

34. Orderly planting is being extended from the cotton and rice crops to maize, and by the chief rainy season of 1928, 70, 50 and 15 per cent. of growers in Western, Central and Eastern Rufiji were lining-out the crop. In the rich alluvial soils, maintained in fertility by natural warping, the planting of maize and pulses in maturing early maize, cotton in ripening maize and rice, and groundnuts (for food) with young maize, continue to show their usefulness; whilst the bonavist bean in

rotation on the lighter soils actually increases their fertility and this, with the similar extension of groundnuts and green gram (chiroko) among them, is improving the welfare of Western Rufiji natives by giving them a balanced ration in the place of the cereal diet that has been up to the present their almost sole resource. Among quick-maturing, drought-resistant crops White Congo maize, a *Panicum* millet and a Dodoma bulrush millet have been distributed, particularly in Mtawi; but here and in Kikale and Magongo the Native Administrations and chiefs require more experience and progress for the work to become properly effective, and in Mtawi continual destruction of crops by game keeps the people backward and discouraged, as well. This continual destruction is far more serious than that from time to time through locusts, flying swarms of which (it may be mentioned) destroyed toward the end of the period over 1,000 acres of maize and 270 and 300 acres of native and estate cotton respectively.

35. As was expected, the better cotton prices of 1927 brought repentance for short-planting, and the output increased from 12 tons of seed-cotton in that year to 116 tons, and would have been greater with better weather. Rice and paddy increased greatly in 1928 to the record export figure of 2,578 tons, worth £15,000 to the native; and the exports of millets and copra were greater also. What appears to be the chief reason for the suddenly increased export of rice is thus recorded by the District Agricultural Officer: "Until 1927-28 there had been no wide demand for Rufiji rice, but following the erection of rice mills in Dar es Salaam a demand has now arisen for local rices for quick consumption along the coast. That the local traders have been able to respond is due to the transport facilities which have brought first the local merchants into more intimate contact with the larger Dar es Salaam firms for whom they now buy on commission: transport facilities on the road by motor lorry, on the river by stern-wheeler, and on the sea by a regular steamer and lighter service, which have made possible handling and transportation of produce in quantity without loss, a circumstance impossible in the days of canoe and dhow transport alone."

36. Estate agriculture of any importance in Rufiji continues to be concerned entirely with sisal and cotton. The area under sisal in 1928 was: Logeloge 2,000, Kilimani 1,200 and Kitundu 1,580 acres; and cutting was expected for May, 1929, at Kilimani, where the rich alluvial valley lands bring early maturity and high weight of leaf. Estate cotton amounted to 528 acres from which 50 tons of seed-cotton was obtained: a poor result.

37. The basis of the district work for native agriculture in the MOROGORO-KILOSA AREA was described and indicated in paragraphs 21, 46 and 52 of the last Annual Report; the three sub-stations were increased to seven, and the success with introduced select crops was maintained and their extension increased. Notable among these crops are potatoes in the Uluguru and Nguru hills and black gram from India. Among the sub-stations mentioned in Appendix II that at Diongoya is of particular interest as it serves an area below the rainy side of the Nguru

Mountains where there is particular promise for most of the tropical crops, including citrus, the oil palm and probably cocoa. Although the beginning of a native coffee industry in the Uluguru and Nguru Mountains is still small, as shown by the following figures it is promising:—

| Tribal Area | | | | Number of Seedlings distributed | Number of Holdings |
|---------------|-----|-----|-----|---------------------------------|--------------------|
| South Uluguru | ... | ... | ... | 4,065 | 73 |
| North Uluguru | ... | ... | ... | 1,140 | 24 |
| Nguru | ... | ... | ... | 2,195 | 48 |
| Totals | | | | 7,400 | 145 |

In reporting on this industry the District Agricultural Officer states: "While a certain amount of persuasion was necessary for the establishment of the demonstration plots, the distribution resulted in the planting out of all available seedlings in the nurseries. The demand was greater than the supply. This has led to the establishment of additional nurseries." The native industry in Morogoro-Kilosa second in importance to the raising of food crops, namely cotton growing which in this season experienced the best success so far, receives attention in a succeeding section of this Report.

38. As regards the DAR ES SALAAM and BAGAMOYO Districts of the Province there is nothing to add to the report on these that was made last year. For both Districts as much assistance as possible was given for agriculture by the Provincial Administration, and it was arranged for the District Agricultural Officer, Rufiji, to give attention to the southern part of Dar es Salaam District; but the provision of an energetic District Agricultural Officer for these districts is necessary before the agricultural progress that is desired in them can be made.

39. Destruction by locusts, except in Rufiji already mentioned, was sporadic in Morogoro-Kilosa, Dar es Salaam and Bagamoyo and of no significance.

40. In the Eastern Province estate agriculture has continued to be concerned chiefly with the extension of sisal-growing principally in Morogoro, Dar es Salaam and (to a smaller extent) Rufiji Districts. Estate cotton continues to be a speculative crop mainly in the Kimamba (Kilosa) area of Morogoro-Kilosa, the whole area producing in the particularly favourable season 7,893 standard bales. Grains and pulses are also being produced to an increasing extent on some estates, and vegetables and fruit on others; and as already mentioned it is hoped to assist this region by the establishment of a mulberry silk industry.

Tabora Province.

41. The work at the Agricultural Station at Ibadakuli (Shinyanga) is described in Part II of the Report, dealing with work of investigation.

42. The work was continued in the Districts of SHINYANGA, NZEGA and KAHAMA, the staff being as before in addition to the District Agricultural Officer an Agricultural Assistant (chiefly for ploughing at Nzega) and an Overseer, Experiment Station. The scope of this was described in some detail in paragraphs 24 to 26 of the last Annual Report.

43. The progress of the introduction and extension of select crops continues to be very satisfactory, those appreciated and taken up most readily by native farmers being short-season millets, introduced maizes, Tepary, bonavist and Madagascar butter beans and pigeon pea, and Virginia bunch groundnuts. Regular planting is being extended by demonstrations to crops additional to cotton, especially to groundnuts, and similar work is being done in co-operation with the Veterinary Department for encouraging the making of ensilage—important in this country of overstocked cattle areas. A work most important in its future promise is the instruction for a whole day a week of over one hundred pupils of Ibadakuli School at the Agricultural Station: as in Rufiji (see above) the situating of such a school at or near an agricultural station is the best assistance for teaching in the chief industry of the country. In another direction agricultural work of first importance is being done by the extension of demonstration and increase on sub-station lines to the sleeping sickness concentrations at Ushirombo and Msumbwe in the Kahama District. Four new sub-stations were opened, all in the Nzega District.

44. Although a good foundation has been laid for the adoption of ploughing by native farmers progress is still slow; actually 1,425 acres were ploughed by these (in addition to areas of 200 and 150 acres ploughed and cross-ploughed at the stations of the Department and the Native Council at Ibadakuli). No assistance was given by the Game Preservation Department this year in ploughing at the Lubaga Anti-Tsetse Settlement. Most of the ploughs owned by natives were in use and the area ploughed by them would have been greater if dry weather had not spoiled the encouragement of the first promising rains. The best progress is so far in Nzega where twelve new ploughs were ordered making a total of thirty-three in use. Ninety-three ploughs were overhauled and repaired at Ibadakuli and a repair shop for native ploughs was opened in Nzega District. The interest of native farmers in implements and machinery is being extended beyond ploughs, as shown by the purchase of harrows, a pilot planter and a maize mill during the year.

45. Although estate agriculture is not a feature of this area, the District Agricultural Officer has given assistance for this wherever required.

Mwanza Province.

46. Agriculturally this is largely one with the Northern Tabora area that has just received report; and except for the Lake Coast area its western portion, narrow from south to north should receive benefit from the investigations that are being carried out at Ibadakuli Agricultural Station, at which instructors are already being trained for this

Province. The district agricultural staff employed is one District Agricultural Officer and two Agricultural Assistants (chiefly for ploughing and other sub-station work).

47. As in other cases the work with crops at sub-stations is shown in Appendix II. The chief of this was done in the KWIMBA DISTRICT (at Ngudu where an Agricultural Assistant is posted), at the Manthare Chief's Seed Farm which had already in the last season supplied seed for all the other sub-stations, at the Shanwa sub-station in direct charge of the District Officer, Maswa, and at the Mwanza (Wiru) Central School to which ploughing instruction has been extended by the use of the light Pony and Improved Mysore ploughs; whilst the work with crops including that for the encouragement of vegetable-growing by natives, and ploughing was being extended to the Kijima Mission School. For the introduction of robusta coffee growing in the areas concerned nurseries have been opened at Karumo, Buchosa and Kome Island in UZINZA (to which two native instructors trained in Bukoba have been sent), MUSOMA (whence some two thousand coffee plants were on the point of being distributed) and UTIMBARE sub-station (from which all the stock had been planted out).

48. As in Northern Tabora the progress with ploughing is slow but (it is considered) sound. The number of ploughs in *use* by natives, including those of Native Councils and private individuals was 36, comprising E.C.—A. 13; Indyebo 12; Mysore Improved 4; Ransome's disc 2; Pony Howard's, Howard's Toto I, Howard's Toto II and Cockshutt 1 each. Of these 25 and 11 were respectively in the Mwanza and Musoma Districts.

49. It is well to record here the state of the economic conditions in the Province, Musoma excepted, up to the beginning of any changes that may take place through the provision of a railway (fully opened in August, 1928) by putting on record the following figures of the chief exports from that region in recent years (blanks mean no exports):—

| Product | 1925 | | 1926 | | 1927 | | 1928 | |
|--------------------|--------|---------|---------|---------|--------|---------|--------|---------|
| | Cwts. | £ | Cwts. | £ | Cwts. | £ | Cwts. | £ |
| Cotton ... | 25,565 | 149,848 | 38,371 | 182,858 | 25,428 | 111,401 | 30,756 | 149,610 |
| Groundnuts | 81,839 | 75,245 | 170,580 | 126,936 | 71,640 | 50,451 | 37,948 | 29,878 |
| Rice ... | 49,190 | 52,888 | 55,125 | 55,450 | 61,769 | 56,576 | 42,523 | 51,532 |
| Other grains | 38 | 24 | 322 | 152 | 3,197 | 1,882 | 2,802 | 1,979 |
| Simsim ... | 6,731 | 6,915 | 9,160 | 8,065 | 7,820 | 7,268 | 6,962 | 5,836 |
| Gum arabic | 9,691 | 7,556 | 4,266 | 3,647 | 1,190 | 1,091 | 215 | 194 |
| Beeswax ... | 228 | 1,420 | 183 | 1,259 | 454 | 3,176 | 261 | 1,783 |
| Cotton seed | — | — | — | — | 14,600 | 2,217 | 49,253 | 7,400 |
| Native tobacco ... | — | — | — | — | 278 | 466 | 278 | 683 |
| Sisal ... | — | — | — | — | 40 | 111 | 260 | 353 |

As these are total figures (for the Province except Musoma) they show exports from Mwanza port for the first three years and exports by both port and the new railway for 1928. To complete the record exports in hundredweights from Musoma in the years stated are given:—

| Product | | | | 1925 | 1926 | 1927 | 1928 |
|------------|-----|-----|-----|-------|--------|--------|-------|
| Groundnuts | ... | ... | ... | 9,320 | 31,800 | 14,400 | 6,780 |
| Grains | ... | ... | ... | 9,380 | — | — | 80 |
| Simsim | ... | ... | ... | 3,020 | 6,780 | 7,960 | 4,880 |
| Ghee | ... | ... | ... | 1,628 | 1,730 | 1,412 | 3,035 |
| Hides | ... | ... | ... | 2,026 | 2,162 | 2,421 | 2,968 |

The reduction in groundnuts throughout the Province is due to two successive bad seasons: there was virtually no rosette disease in 1928. In this year rice exports were reduced for the same reason. The demand for gum arabic had decreased (but was greatly increasing in 1929). The chief producers of beeswax are the Zinza tribe.

50. Estate agriculture in the Province is still small. In 1928 it accounted for the export of 121 bales of cotton (season 1928-29) and 13 tons of sisal, the latter export being, however, reduced through the extent of local rope-making.

51. Locusts began to appear in an isolated way in December, 1928, and the increase of swarms toward the end of February, 1929, in the South-Eastern area caused serious apprehension (which happily however was not eventually justified).

Bukoba Province.

52. The agricultural staff and organization in this Province were described in detail in paragraphs 31 and 32 of the last Report. To that staff a second Agricultural Assistant for coffee was added during the year, thus providing means for enabling instruction and supervision for the large native coffee industry for its improvement to be much more effective.

53. In BUKOBA DISTRICT the coffee-growing regulations adopted by the Native Administration were extended to include provisions for the improvement of the marketed product and prevention of harbouring bad coffee and coffee waste on native farms; the carrying-out of these regulations is assisted by the usual means, employing Native Instructors belonging to the Department (average 8) and the Native Administration (average 7) under the direction and advice of an Agricultural Assistant for coffee who is in turn responsible to the District Agricultural Officer concerned, and further by the issue of typewritten practical instructions; this scheme enables the native Headman to be reached, who is responsible under the Native Administration for making the work effective. The District Agricultural Officer reports that already as a result of

these efforts the general standard of native coffee cultivation shows slow but stable improvement, nurseries are being used by most of the cultivators in the place of the planting of self-sown coffee seedlings that was customary and regular methods are used for planting out, less unripe cherry is picked than formerly, coffee-drying on mats instead of the bare ground or the road is now general and the native mortar and pestle is being replaced by simple, locally constructed machines, for hulling; also, there is some increasing interest in the wet method of preparation through demonstration with the small pulpers mentioned in the last report. The Native Administration is gradually acquiring apparatus and materials for dealing with coffee pests, and the owners of coffee are learning how to use them. Bukoba aided coffee-growing in other areas of the Territory by providing 1,300lb. of fresh, pest-free, selected and inspected robusta coffee seed, the supplies from Amani having proved inadequate.

54. There is no significant increase in the estate production of coffee in Bukoba: last year's figure for this was about 500 acres, more than one-half being in Arabian; whilst in the year under report they were recorded in acres as: Arabian 301, robusta 251, altogether on nine estates, none of which contain more than 180 acres of coffee, the smallest area being as low as ten acres.

55. Regarding industrial means for the improvement of Bukoba coffee progress is being shown by the erection of a pulping factory near Kamachumu by an European, and by the purchase by a native coffee grower near Katoma of a Mackinnon African Huller, No. 1, having a capacity of 1,300lb. an hour, and an 18 h.p. Petter oil engine to drive it.

56. The slow progress of the native coffee industry started in the Bugufi area of BIHARAMULO has caused nursery work to be concentrated for the present at Niamiaga, near which place an Administrative Officer is now to be posted. As the different conditions of altitude and rainfall in the region appear to afford areas suited to Arabian coffee, it has been arranged to make experiments with this whilst extending robusta in its own favourable areas. A census which was incomplete when the annual report on this work was submitted showed that in fourteen villages out of a total of fifty there were 237 planters of coffee with 2,025 robusta and 1,076 Arabian plants.

57. Work in sub-stations proceeds slowly in BUKOBA because of native apathy and the poor quality of labour; increased staff and more experience should, however, make this work more satisfactory. Work in the nine chief school gardens of the District was fair to satisfactory in seven, and in the two others poor. Attempts to introduce the extensive growing of wheat in Karagwe have met with little success so far, but are being continued. The introduction of *Hydnocarpus anthelmintica*, the oil of which is specific in leprosy, is giving promising results, as in other parts of the Territory.

58. Organized cotton-growing in the Bukoba Province is being carried out at present in the areas of Busambiro, Kimwami and Rusubi, of BIHARAMULO served by the pioneer ginnery of the British Cotton

Growing Association, and development should provide an economic crop outlet for 32,000 males. The amount of seed distributed was increased from 23 tons for the crop of 1928 to 32½ tons for that of 1929. The introduction of this crop has entailed hard work for both Administrative and Agricultural Officers, but the apathy of the natives toward it is decreasing and there is improvement already in the cultivation and the size of the plots, the latter being still capable, however, of considerable increase without any danger to the production of food-crops. A broker's report on the cotton was: "Clean, creamy in colour, staple full 1½ in., medium strength." As an experiment this work has shown that December and early January are too early for planting, the best results being obtained in the period January to February.

59. In BIHARAMULO the work in sub-stations was satisfactory, whilst that in the Government School failed owing to the vicissitudes undergone by the school itself. This work is naturally concerned principally with food-crops, but special efforts are being made for the extension of rice-growing with a view to export and the revival of the groundnut export chiefly by using the plant in a rotation with cotton.

Lindi Province.

60. A close description of the economics of the areas in this Province as grouped for agricultural purposes was given in the last Report, and need not be repeated here. The founding of the sub-stations, foreshadowed in that Report when the establishment of Native Authorities should be completed, was proceeded with for four areas in the LINDI region, and in other cases where funds were not available preparatory work was done on small demonstration plots; the Missions also continued to help in the production of improved seed, chiefly of food-crops. Of other ordinary native crops, tobacco was assisted by the introduction of select seed and by demonstration of cultivation and curing in the Tunduru-Rovuma area (by the District Agricultural Officer, Songea), and groundnut-growing was extended by the distribution of two tons of seed on condition of return of a proportion of the seed obtained, for further distribution. Some progress appears to have been made in the four sub-stations and demonstration plots, but the destruction of the crops in the two Makonde sub-stations by the locusts that reached Lindi in the invasion interfered with the year's work in these. As regards cotton the chief increase of output (by more than double) took place in MIKINDANI, and cotton-growing was revived in TUNDURU by the distribution of fifty-two bags of seed on the promise by Lindi ginnery that they would buy the resulting seed-cotton there. A pioneer ginnery at Masasi or Tunduru would be of great value for extending the cotton industry of the surrounding region.

61. In the LINDI area (Lindi, Mikindani, Newala, Masasi and Tunduru) the total value of the exports in 1928 was £206,966 made up of native £126,954 and non-native £80,012 or 61 and 39 per cent. respectively. The four chief native export products, grain, simsim, cotton and groundnuts had respective values of £49,084, £37,331, £21,823 and £10,210; whilst those of the chief non-native exports were: sisal £75,839

and copra £4,000. The two chief native exports, grain and simsim, accounted by value for 24 and 18 per cent. of the total, and the two principal non-native exports, sisal and copra, for 36 and 2 per cent. of this. The preponderating value of estate agriculture through sisal, shown by these figures, is likely to be at least maintained, for the exports of sisal (grown in the Lindi and Mikindani Districts) have increased by weight to 2,765 tons in 1928 from 2,598 and 1,800 tons in the two preceding years, and are still to be significantly further increased when the 4,590 and 4,192 acres said to have been planted respectively in 1927-28 and 1928-29 become ready to be cut.

62. The most striking agricultural feature of the year in the KILWA area was the sudden and fifteen-fold increase of export by weight of grain: in value from £1,084 in 1927 to £10,829 in 1928. Although some of this grain comes from places outside the area most of the increase is to be attributed to increased marketing, and probably increased production, within it through the facilities and better prices afforded by the making of roads. Thus the value of grain exported came to exceed that of the former principal agricultural export, simsim, namely £10,642. The only other exports of chief value are mainly produced by native labour under non-native direction: they were copra, £6,699, and mangrove bark, stated to have an export value of £16,353.

Kigoma Province.

63. Increase of staff has enabled the work to include the Ufipa-Rukwa area in the south-west as well as the Kasulu and Kibondo Districts the activities in which were summarized on pages 10 and 11 of the last report. The progress with coffee in KASULU and KIBONDO continues to be slow, but a good foundation for extension of the industry has been made: the total number of plants (robusta) set out by native farmers in the two years since stock has been available from the nurseries, namely in 1927-28 and 1928-29, is 13,050 among 398 farmers. That interest is increasing is shown by the circumstance that all plants of suitable size had been taken from the nurseries by March, 1929. The best propaganda for coffee-growing will be the coffee itself, when these plants come into bearing. As a result of a visit by the Governor to the region, it has been decided that the planting of robusta coffee in the Kibondo Highlands shall give place to that of Arabian, which is more likely to thrive at the higher altitudes in these areas where the distribution of rainfall is not ideal for coffee; and a useful supply of seedlings will be available for planting out from a large nursery at Kibondo in January, 1930. The future management of the work will be assisted by a visit that was made by the District Agricultural Officer, accompanied by a local native instructor, for observation of the control of the Bukoba coffee industry.

64. No Native Administration sub-stations for ordinary crops in Kasulu and Kibondo have yet become possible, but the Senior Headmen in both districts have co-operated in the trial and increase of select seeds introduced by the Department. As a result Dodoma White millet has

become a favourite with growers and Potchefstroom Pearl maize is described by the District Agricultural Officer as a "great success" among them. An interesting circumstance regarding rice, little heard-of so far in the area, is that the provision of the Tabora-Mwanza railway has opened the Uganda market for this crop to the Ujiji rice mills so that rice from the area has begun to reach these mills in some significant quantity. Kenya Governor wheat, introduced by the Department, is showing success; and the Native Administration is assisting with the introduction of the Tanganyika queen-excluder hive for improving the wax collecting industry. All this development, caused by improved facilities of transport, will be assisted by the work that has been begun for teaching ploughing in the Kasulu Highlands: work for which the Native Administration has purchased ploughs, to lead the way.

65. Estate enterprise in the Kigoma Province is as yet small and consists chiefly of sisal-planting by a few Europeans and Indians near the railway, and coffee planting near Uvinza and also near the Central Line by these and Arabs as well, all in the KIGOMA District.

66. The circumstance that it was not possible to provide a District Agricultural Officer for the UFIPA-RUKWA area until November, 1928, did not enable much to be done other than this officer's making himself acquainted with the agriculture of the district and its possibilities on the foundation of a basic economic survey already carried out by the Director. Nevertheless, sub-stations were established: one at Sumbawanga to form a central seed-supply and demonstration area for the Ufipa Plateau and one at Rungwa similarly for the Rukwa Plain, particularly for the sleeping sickness areas. Improvement of the groundnut industry is being sought, at first with the aid of the Imperial Institute by an enquiry into the lowered oil-content of groundnuts grown in the area. With the main object of helping the people in these areas, too, organized planting of about 140 acres of cotton was carried out under the direct teaching of a trained native instructor from Morogoro, on communal plots by the inhabitants of each village; the growth of this was reported to be very satisfactory, and cotton-growing on similar lines was to be extended southward next year. The pioneer ginnery necessary for this activity is being provided by the British Cotton Growing Association.

67. The best earnest for success in increasing the extent and variety of production in the area, namely the provision of roads and facilities for marketing, is the beginning made by the supply of a motor road from Sumbawanga to Kipili on the Lake, of a good market at Sumbawanga itself, and the ginnery just mentioned.

68. It is intended that the work in the KAREMA area, begun by the District Agricultural Officer, Kasulu, in a Native Administration sub-station at that place, shall be transferred to the District Agricultural Officer, Ufipa-Rukwa.

Iringa Province.

69. The year saw the first posting of a District Agricultural Officer in this Province, an Officer with special knowledge of tobacco and sub-tropical estate agriculture. The following is taken from the Annual Report of this officer.

70. "Very little has been done owing to the late arrival of the only District Agricultural Officer in the Province, and to the absence of trained native Instructors. Native Instructors are now being trained in co-operation with the Education Department at the Central School at Malangali.

71. "Two sub-stations were opened, one at Kalenga in the IRINGA District and one at Mbandu in the NJOMBE District, in an endeavour to increase both the quantity and the quality of native food-crops. Both sub-stations are maintained by Native Council funds. Potchefstroom Pearl and White Congo maize, Virginia Bunch groundnuts, potatoes, sunflowers, field peas, field beans, soy beans and simsim were planted, but at this stage it cannot definitely be said that these crops are suited to the Districts in which they were sown.

72. "It is with estate agriculture that this Department has been principally concerned in this Province, and work has been concentrated chiefly on establishing a Turkish tobacco industry in the IFUNDA area of the Iringa District. A fair quality of Turkish leaf has been produced and samples of this which were sent to London have been favourably reported upon by London brokers. Quantities of a bale or more which were sent to London at various times have always arrived there in unsaleable condition, and it would seem that some difficulty will be experienced in landing any quantities there without first fermenting it. On the other hand, an unfermented bale which was sent to Capetown, found no market there but arrived in excellent condition, which fact might indicate that Turkish leaf tobacco if properly baled in the right condition may carry to London without fermentation. Experiments have been devised (but have not yet been carried out) to ascertain: firstly, the best place to ferment Turkish tobacco; and secondly, if there is a period of the year when it may be possible to send Turkish tobacco to London without first fermenting it.

73. "The type of Turkish tobacco leaf which is being grown is Soulook and the difficulties that beset planters in the curing of this type of leaf clearly show that other types should be tried which may be easier in the curing at altitudes above 5,000 feet.

74. "A fair market for heavy Virginia tobacco has been found in London and this type has been sown to some extent but in most cases has failed owing to late planting. The same has happened in the case of light Virginia tobacco though no market exists for this commodity.

75. "A consignment of 50½ maunds of Manipuri tea seed arrived in the Iringa District for the planters of DABAGA and MUFINDI. Unfortunately, the seed had deteriorated in transit and the germination was

very poor, averaging from 4 to 16 per cent. for different portions of the consignment.

76. "Coffee nurseries have been planted in different parts of the Province with mixed success and help has been given in the selection of sites.

77. "The Iringa Bacon Factory commenced operations in March, 1929, and although not yet working at its full capacity is enabling many farmers to sell their farm products 'on the hoof'. A great deal of help has been given in the growing of pig feeds."

78. Some of the varied assistance given to planters by this officer is shown by the following extract from his last monthly report during the period under review: "The Turkish tobacco crop of last season was graded. Advice was given on the following: Turkish and Virginia tobacco, winter and summer cereals, earth wall dam construction, irrigation furrows, groundnuts, sweet potatoes as pig feed, pruning of fruit trees and grape vines, and farm building construction."

79. For the particular assistance of planters in this area the tea report and coffee pamphlet mentioned in paragraph II were issued, the latter in the pamphlet series of the Department. At the end of the period it had not yet been possible to fill the appointment District Agricultural Officer, Tea, for the Province. Owing to the shortage of officers the work for the RUNGWE District described in the last report was not extended, although it was maintained.

80. The Agricultural and Pastoral Survey (Land Development Survey) of the South-Western Highlands was continued until the rain set in, the Deputy Director being seconded for the agricultural work of the Survey.

Mahenge Province.

81. After an economic examination of the SONGEA area, comprising the Wangoni Plateau, Matengo Highlands and Lake Nyasa littoral, by the Director, the District Agricultural Officer, Rufiji, was sent to the area to plan the agricultural work for which the officer who had been trained in native tobacco-growing in Nyasaland was now available. Four sub-stations with the usual crops, and including wheat at the high altitudes, were opened at the Native Courts of the First Class and three demonstration plots at second-class courts: these were intended to serve the three regions mentioned above, that of the Wangoni Plateau being divided into the areas of the Zulu Wangoni and Mbonani Wangoni, the latter with its highland area of North Hanga. This officer was also placed in charge of the special work with coffee and cocoa to be raised in nurseries for distribution in the sheltered moist valleys of the Matumbi area of MAHENGU District, more favoured by rainfall than the whole of the rest of the region.

82. The aim of the work is to provide, while conserving and extending the growing of food-crops, the more valuable crops tobacco, cotton and robusta coffee as cash crops which will find a profitable outlet along the

roads of access with which this remote region has now been provided. For tobacco the object is to improve the native product so that it is similar to Nyasaland native tobacco and, therefore, exportable when there is a demand for it; and for the purpose planting and curing demonstrations were begun and natives taught to produce good seed of the select kinds, and the erection was planned at the four sub-stations of tobacco-curing barns, of mud and grass, easily copied by the native farmer. The trials with cotton, especially in the Mbonani area, showed good promise; and it is hoped that their success will give, with the aid of a pioneer ginmery, this valuable crop to the natives of this region. Robusta coffee may be successful too, in the limited conditions of the more sheltered valleys and with water for irrigation; and four nurseries have been made for supplying seedlings to enterprising native farmers in favourable situations.

83. Beside the work in Matumbi, just mentioned, there has been no activity of the Department in the MAHENGÉ district, for want of an agricultural officer; but provision for a District Agricultural Officer has been made, whom it is intended to station at Ifakara on the Kilombero River for the development of the fertile valley of this great stream.

84. There is only an insignificant amount of activity in estate agriculture in the Mahenge Province, and this is confined almost entirely to the Mahenge Plateau.

PROGRESS OF THE CHIEF EXPORT CROPS.

85. This section gives first the general progress of all the chief crops, and then that of each of them with the production of the different principal areas.

General Progress.

86. For this see Appendix VII which presents the figures of export of the ten principal agricultural and forest products in 1928, with those of 1913 and 1924 to 1927 for comparison.

Sisal.

87. The output increased but the value fell. This increase is expected to continue through extension in the old areas of Tanga, Morogoro and Dar es Salaam, Pangani and Lindi and the recent new plantings in Rufiji, Kigoma, Arusha and to some extent in Mwanza. The exports from the principal areas have been recently as follows:—

| | 1927 | 1928 |
|--------------------------------------|--------|--------|
| | Tons | Tons |
| Tanga and Pangani | 24,185 | 26,500 |
| Morogoro and Dar es Salaam | 5,697 | 5,652 |
| Lindi | 2,599 | 2,767 |

Cotton.

88. The *seasonal* output of lint from ginneries in the years 1925 to 1928 was as follows:—

| Province | In pounds | | | | Difference per cent. | |
|--------------|-----------|-----------|-----------|------------|----------------------|-------|
| | 1925 | 1926 | 1927 | 1928 | 1927 | 1928 |
| Eastern ... | 3,054,171 | 5,442,152 | 2,839,710 | 7,506,758 | — 49 | + 164 |
| Tabora... | 365,022 | 615,350 | 410,892 | 478,701 | — 33 | + 17 |
| Mwanza ... | 3,510,689 | 2,687,650 | 2,648,995 | 4,422,357 | — 10 | + 67 |
| Lindi ... | 855,178 | 559,573 | 340,620 | 525,726 | — 39 | + 54 |
| Tanga ... | 603,350 | 140,082 | 52,239 | 106,721 | — 63 | + 104 |
| Northern ... | 267,814 | 264,662 | 93,999 | 105,134 | — 68 | + 12 |
| Mahenge ... | 10,783 | — | — | — | — | — |
| Bukoba ... | 8,546 | 2,819 | — | 36,127 | — | — |
| Iringa ... | 14,128 | — | — | — | — | — |
| | 8,689,680 | 9,712,288 | 6,886,455 | 13,181,524 | — 34 | + 106 |
| Bales | 21,724 | 24,281 | 15,966 | 32,965 | | |

Of this the share of estate production was recorded as 8,542 bales*, or 26 per cent., as follows:—

| | | | | |
|-------------------|-------|------------|-----|-----|
| Morogoro-Kilosa | 7,893 | Mwanza ... | ... | 121 |
| Bagamoyo ... | 146 | Tanga ... | ... | 121 |
| Dar es Salaam ... | 138 | Lindi ... | ... | 32 |
| Rufiji ... | 71 | Moshi ... | ... | 17 |
| Kilwa ... | ... | ... | ... | 3 |

Thus we have reached the significant production of 32,965 bales, or an output more than one-third larger than the largest previous crop, namely the 24,281 bales of 1926. The low prices received for the latter through the depressed state of the world's markets caused discouragement that led to the much lower production of 15,966 bales in 1927. Through the better prices of the year just mentioned, discouragement gave place to encouragement; and as a result we have the present "record" output. The first production of cotton in the Territory after the European war was 7,177 bales in 1922, followed by 11,434 and 18,793 bales in 1923 and 1924; thus the output has become more than four-and-a-half times what it was in the first year. In the first four years after 1922 there was a steady increase of an average of 4,275 bales a year, which would bring an output of 32,831 bales in 1928; so that, notwithstanding the setback of 1926, the rate of increase has been more than maintained.

89. The sales of seed-cotton by natives during the season are shown in the following table which should be compared with the similar table on page 14 of the last Report:—

*The actual figure is less than this, as some native cotton is doubtless marketed as estate cotton.

| Area | 1st Quality | 2nd Quality | 3rd Quality | Total | Value |
|-------------------------|-------------|-------------|-------------|-----------|-----------|
| | Kgs. | Kgs. | Kgs. | Kgs. | Shs. |
| Morogoro-Kilosa | 4,163,471 | 449,039 | 1,006,306 | 5,618,816 | 2,290,664 |
| Rufiji | 71,115 | 12,890 | 32,449 | 116,454 | 33,910 |
| Dar es Salaam | 28,117 | 4,404 | 7,640 | 40,161 | 14,260 |
| Bagamoyo | 158,117 | 15,830 | 22,000 | 195,947 | 76,514 |
| Lindi | 454,715 | 30,571 | 96,346 | 581,632 | 229,097 |
| Kilwa | 80,251 | 20,653 | 49,063 | 149,967 | 58,717 |
| Pangani and Handeni ... | 75,659 | 5,943 | 8,281 | 89,883 | 29,371 |
| North Pare (Moshi) ... | 46,340 | 31,493 | 33,762 | 111,595 | 36,004 |
| Tabora Province | 452,291 | 77,650 | 179,639 | 709,580 | 243,358 |
| Mwanza Province | 4,632,252 | — | 1,078,753 | 5,711,005 | 2,082,033 |
| Biharamulo | 38,203 | — | 17,814 | 56,017 | 15,177 |

90. The range of prices, which can be compared with those recorded in former Annual Reports, was as follows in cents of a shilling per kilogram:—

| Centre | 1st Quality | | 2nd Quality | | 3rd Quality | |
|-------------------------|-------------|---------|-------------|---------|-------------|---------|
| | Maximum | Minimum | Maximum | Minimum | Maximum | Minimum |
| Ngerengere | 55 | 44 | 45 | 34 | 27 | 22 |
| Kilosa | 58 | 43 | 48 | 33 | 29 | 20 |
| Mikese | 53 | 40 | 43 | 32 | 26 | 10 |
| Kimamba | 54 | 42 | 44 | 32 | 27 | 20 |
| Bagamoyo | 51 | 40 | 40 | 28 | 26 | 20 |
| Mohoro (Rufiji) | 49 | 39 | 39 | 31 | 25 | 19 |
| Kilimani | 40 | 28 | 25 | 20 | 20 | 14 |
| Lindi | 50 | 40 | 40 | 30 | 30 | 20 |
| Mikindani | 50 | 38 | 40 | 28 | 25 | 19 |
| Masasi | 40 | 35 | 30 | 25 | 20 | 17 |
| Nonsio (Mwanza) | 44 | 32 | — | — | 22 | 16 |
| Missunjwi | 43 | 25 | — | — | 22 | 16 |
| Usogore (Shinyanga) ... | 51 | 35 | 42 | 26 | 20 | 13 |
| Moshi | 50 | 45 | 35 | 30 | 20 | 15 |
| Biharamulo | 35 | 31 | — | — | 18 | 13 |

91. The provision of Cotton Market Supervisors, through a cess collected on all purchases of native seed-cotton, for the markets in the Morogoro-Kilosa area, has proved very successful and effective; and it is proposed to extend the scheme to other areas with leased cotton markets, namely Mwanza Province and Lindi area.

NOTE.—*This figure includes Bagamoyo cotton sold at Morogoro buying centres, which is estimated at 300 tons.

Coffee.

92. The production in the chief areas in the years shown was:—

| | 1927 Cwts. | 1928 Cwts. |
|--------------------------|---------------|---------------|
| Bukoba | 78,879 | 156,640 |
| Northern Province | 50,428 | 45,732 |
| Usambara District | 1,853 | 5,604 |

This is the largest export so far from Bukoba, where the production is virtually all native. The total export of estate and native coffee was in the years mentioned:—

| | 1927 | | 1928 | |
|---------------|--------|---------|---------|---------|
| | Cwts. | £ | Cwts. | £ |
| Estate | 45,019 | 211,380 | 43,772 | 220,286 |
| Native | 86,880 | 252,040 | 164,850 | 519,361 |

Groundnuts.

93. Exports were as follows:—

| | 1927 Tons | 1928 Tons |
|---|--------------|--------------|
| Mwanza and Northern Tabora | 9,188 | 4,636 |
| Central Province and Southern Tabora | 4,500 | 5,387 |
| Remainder (chiefly Lindi) | 460 | 572 |

The decrease in 1928 was due to an unfavourable season, especially in Mwanza, although no rosette disease was reported. A steady cause of decrease is doubtless the extending internal consumption of the groundnut.

Copra.

94. From a state that was virtually stationary the exports of copra are reaching a condition of increase, there being little doubt that a cause of this is the steadily closer attention that is being given to inspection under the Plant Pest and Disease (Coconut) Regulations. Recent detailed export figures are as follows:—

| | 1927 Tons | 1928 Tons |
|-----------------------------------|--------------|--------------|
| Tanga-Pangani | 2,719 | 4,152 |
| Mafia | 1,410 | 1,626 |
| Dar es Salaam and Bagamoyo | 2,592 | 2,941 |
| Kilwa-Lindi | 546 | 599 |

Simsim.

95. The export remains steady, from the chief producing areas, as follows:—

| | 1927 Tons | 1928 Tons |
|---------------|--------------|--------------|
| Lindi | 1,904 | 1,888 |
| Mwanza | 794 | 428 |
| Kilwa | 442 | 580 |

Grain.

96. In the following table the exports are given from the chief areas of production, as shown:—

| | 1927 | | 1928 | |
|----------------------|-------|---------------------|--------|---------------------|
| | Tons | Percentage of Total | Tons | Percentage of Total |
| Rice, Mwanza | 3,916 | 99 | 2,126* | 53 |
| Millet, Lindi | 1,451 | 40 | 5,323 | 69 |
| MAIZE— | | | | |
| Tanga | 758 | 57 | 305 | 22 |
| Lindi | 163 | 12 | 535 | 38 |

*NOTE.—Actual total export by steamer and railway.

As a result of the provision of the Tabora-Mwanza Railway, some of the rice that is exported from Mwanza comes from Kigoma Province through the mills at Ujiji, the amount of this in the year under review being estimated at 250 tons.

Various Products.

97. The detailed figures for these are tabulated as follows:—

| | | | | | | 1927 | 1928 |
|------------------------------------|--|--|--|--|--|--------|--------|
| | | | | | | Cwts. | Cwts. |
| BEESWAX— | | | | | | | |
| Morogoro, Dodoma and Tabora | | | | | | 9,821 | 8,185 |
| Mwanza | | | | | | 454 | 262 |
| Lindi [†] | | | | | | 855 | 1,169 |
| Kilwa | | | | | | 13 | 128 |
| CHILLIES | | | | | | 138 | 192 |
| GUM ARABIC— | | | | | | | |
| Mwanza and Northern Tabora | | | | | | 6,681 | 13,398 |
| GUM ANIMI (COPAL)— | | | | | | | |
| Bagamoyo | | | | | | 2,101 | 2,196 |
| Kilwa | | | | | | 1,119 | 616 |
| Lindi | | | | | | 198 | 55 |
| Rufiji | | | | | | 129 | 120 |
| MANGROVE BARK— | | | | | | | |
| Kilwa | | | | | | 83,900 | 69,740 |
| Rufiji | | | | | | 82,700 | 95,700 |
| RUBBER— | | | | | | | |
| Plantation (Cearà) | | | | | | 1,755 | 673 |
| Wild | | | | | | 800 | 175 |
| RAW SUGAR† | | | | | | 320 | 901 |
| SYRUP (Molasses) | | | | | | 560 | 1,134 |

*About 250 cwts. of the export from Lindi usually comes from Songea. †Chiefly from Pangani.

LEGISLATION.

98. The following legislation dealing with agricultural matters was enacted or published for information during the period under report:—

Coffee Industry (Registration and Improvement) Ordinance (No. 23 of 1928) enacted on 29th June, 1928.

Coffee Industry (Regulation and Improvement) Regulations, 1929, made by the Governor in Council on 4th February, 1929.

Plant Pest and Disease (Coffee) Regulations, 1928, made by the Governor on 25th September, 1928.

Draft Produce Export Ordinance, 1929, published on 29th March, 1929.

Draft Export (Coffee) Rules, 1929, published on 29th March, 1929.

Draft Destruction of Locusts Ordinance, 1929, published on 29th March, 1929 (when subsequently enacted, followed by the Destruction of Locusts Regulations, 1929).

Cotton Rules, 1928, made by the Governor on 17th May, 1928, imposing a cess on purchases of seed-cotton in the Morogoro and Kilosa Districts.

METEOROLOGICAL MATTERS.

99. The number of meteorological stations equipped and supervised by the Department at the end of 1928 was 117, of which 94 furnished regular records; and of these 48 had rain gauges only. The first-order station at Agricultural Headquarters at Dar es Salaam was maintained, and the records as well as those of rainfall at various stations in the Territory were published regularly in the *Government Gazette* and the local press. During the period the newly organized East African Meteorological Service, with its headquarters at Nairobi, began to take over the work by the making of higher-order stations; but it is intended that the Department shall continue the management of the lower-order stations (with a maximum equipment of rain gauge, and maximum and minimum and wet and dry bulb thermometers) spread throughout the Territory, the equipment being maintained and extended as requisite by the East African Meteorological Service.

REVENUE.

100. The details of this are given in Appendix VI.

A. H. KIRBY,
Director of Agriculture.

APPENDIX I.

DISTRIBUTION OF PLANTING MATERIAL. (By Provinces.)

RICE:

| | |
|-------------------|---|
| Hill | Headquarters, 14 kgs. |
| Borakupata | Eastern, 10 kgs.; Agricultural Stations, 13 kgs. |
| Faya | Central, 50 kgs. |
| Marula | Lindi, 11 kgs.; Tanga, 22 kgs. |
| Unyengwa | Eastern, 175 kgs.; Kigoma, 45 kgs.; Mahenge, 11 kgs.; Agricultural Stations, 1,045 kgs. |
| Afa | Eastern, 4 kgs. |
| Ordinary | Mwanza, 187 kgs.; Agricultural Stations, 10 kgs. |
| Sena | Tanga, 184 kgs. |

MAIZE:

| | |
|---------------------|---|
| Argentina | Central, 30 kgs.; Lindi, 55 kgs.; Mahenge, 9 kgs.; Headquarters, 40 kgs. |
| Potchefstroom Pearl | Central, 3,500 kgs.; Tabora, 1,883 kgs.; Bukoba, 4 kgs.; Lindi, 10 kgs.; Kigoma, 152 kgs.; Tanga, 648 kgs.; Agricultural Stations, 3,759 kgs. |
| White Cango | Central, 2,000 kgs.; Northern, 94 kgs.; Eastern, 90 kgs.; Tabora, 29 kgs.; Mwanza, 165 kgs.; Bukoba, 4 kgs.; Lindi, 405 kgs.; Kigoma, 45 kgs.; Tanga, 390 kgs.; Agricultural Stations, 5,182 kgs.; Headquarters, 363 kgs. |
| Kenya Hybrid | Eastern, 198 kgs.; Lindi, 1,195 kgs.; Mahenge, 45 kgs.; Tanga, 29,500 kgs.; Agricultural Stations, 5,600 kgs. |

PEAS:

| | |
|---------------|---|
| Cowpea | Central, 5,200 kgs.; Mwanza, 18 kgs.; Tanga, 500 kgs.; Agricultural Stations, 14 kgs. |
| Field | Kigoma, 53 kgs.; Headquarters, 1 kg. |
| Pigeon | Central, 400 kgs.; Tabora, 550 kgs.; Mwanza, 22 kgs.; Agricultural Stations, 550 kgs. |

GROUNDNUTS:

| | |
|-----------------------|---|
| Ordinary | Northern, 2 kgs.; Tanga, 298 kgs.; Agricultural Stations, 500 kgs. |
| Virginia Bunch | Tabora, 90 kgs.; Mwanza, 136 kgs.; Lindi, 21 kgs.; Mahenge, 13 kgs.; Agricultural Stations, 90 kgs. |
| CASSAVA (Sets) | Central, 40,000 kgs. |
| SIMSIM | Eastern, 45 kgs.; Mwanza, 229 kgs.; Headquarters, 80 kgs. |
| White | Lindi, 11 kgs.; Tanga, 112 kgs. |

BEANS:

| | |
|------------------------|--|
| Bonavist | Eastern, 153 kgs.; Tabora, 202 kgs.; Mahenge, 11 kgs.; Agricultural Stations, 402 kgs. |
| Canadian Wonder | Northern, 20 kgs.; Lindi, 10 kgs.; Mahenge, 9 kgs.; Tanga, 233 kgs. |
| Gram | Lindi, 3 kgs.; Mahenge, 4 kgs.; Tanga, 500 kgs.; Agricultural Stations, 862 kgs. |

BEANS.—(contd.):

| | | |
|-------------------|-----|--|
| Hopi, brown | ... | Headquarters, 2 kgs. |
| „ white | ... | Headquarters, 5 kgs. |
| „ pink | ... | Headquarters, 1 kg. |
| „ mat | ... | Headquarters, 6 kgs. |
| „ velvet | ... | Lindi, 20 kgs.; Agricultural Stations, 40 kgs. |
| Tepary | ... | Central, 250 kgs.; Tabora, 347 kgs.; Lindi, 5 kgs.; Mahenge, 13 kgs.; Agricultural Stations, 366 kgs.; Headquarters, 11 kgs. |
| Sugar | ... | Northern, 6 kgs.; Lindi, 2 kgs.; Tanga, 135 kgs.; Agricultural Stations, 3 kgs. |
| Soya | ... | Northern, 6 kgs.; Headquarters, 4 kgs. |
| Lima, white | ... | Tabora, 13 kgs.; Lindi, 2 kgs.; Agricultural Stations, 28 kgs. |
| „ abundance | ... | Northern, 5 kgs.; Mahenge, 9 kgs.; Agricultural Stations, 232 kgs. |
| Madagascar Butter | ... | Tabora, 44 kgs.; Mwanza, 4 kgs.; Lindi, 2 kgs.; Tanga, 68 kgs.; Agricultural Stations, 44 kgs.; Headquarters, 9 kgs. |
| Lentil | ... | Northern, 1 kg. |

MILLET:

| | | |
|--------------------|-----|---|
| Bulrush | ... | Agricultural Stations, 195 kgs. |
| Suksha | ... | Agricultural Stations, 22 kgs. |
| Panicum frumen- | | |
| taceum | | Agricultural Stations, 1,083 kgs. |
| Proso | ... | Central, 150 kgs.; Lindi, 25 kgs.; Agricultural Stations, 426 kgs. |
| Scoti Red | ... | Agricultural Stations, 1 kg. |
| Sorghum Bonganhilo | | Central, 2,800 kgs.; Lindi, 77 kgs.; Mahenge, 9 kgs.; Tanga, 181 kgs.; Agricultural Stations, 1,494 kgs. |
| „ Kilinyali | | Lindi, 20 kgs.; Tanga, 81 kgs.; Agricultural Stations, 751 kgs. |
| „ Feterita | .. | Central, 300 kgs.; Tabora, 4 kgs.; Mwanza, 129 kgs.; Bukoba, 11 kgs.; Lindi, 1 kg.; Mahenge, 2 kgs.; Agricultural Stations, 11 kgs. |
| „ Dwarf | | |
| „ Hegari | | Mahenge, 4 kgs.; Agricultural Stations, 1 kg. |
| „ Ordinary | | Tanga, 4,000 kgs. |
| Potatoes | ... | Eastern, 26 kgs.; Lindi, 72 kgs.; Tanga, 3,232 kgs. |

WHEAT:

| | | |
|----------------|-----|--|
| Kenya Governor | ... | Lindi, 18 kgs.; Kigoma, 15 kgs.; Mahenge, 104 kgs.; Headquarters, 195 kgs. |
|----------------|-----|--|

COFFEE:

| | | |
|-----------------------|-----|---|
| Arabica | ... | Eastern, 22 kgs. |
| Robusta | ... | Mahenge, 22 kgs.; Tanga, 90 kgs.; Agricultural Stations, 6 kgs.; Headquarters, 6 kgs. |
| „ seedlings | ... | Kigoma, 7,200 kgs.; Agricultural Stations, 540 kgs. |
| Sunflower | ... | Agricultural Stations, 70 kgs. |
| Tea | ... | Iringa, 676 kgs. |
| Ginger | ... | Northern, 7 kgs.; Tanga, 8 kgs. |
| Fodder Plants (pkts.) | | Northern, 8 pkts. |

| | |
|--------------------------|--|
| Fruit Trees (seeds)... | Agricultural Stations, 33 pkts. |
| " " (seedlings) | Agricultural Stations, 1,758. |
| Decorative Plants | |
| (seeds) | Northern, 7 pkts. |
| Decorative plants | |
| (seedlings, roots, etc.) | Agricultural Stations, 50 pkts. |
| Miscellaneous Plants | |
| (seedlings) | Northern, 8; Agricultural Stations, 846. |
| Sesbania sp. | |
| (seedlings) | Northern, 19. |
| Vegetables | Eastern, 1 pkt.; Lindi, 1 pkt.; Kigoma, 1 pkt. |
| Castor Seed | Tabora, 9 pkts.; Agricultural Stations, 9 pkts. |
| Tobacco | Lindi, 2 pkts.; Iringa, 1 oz.; Mahenge, 1 pkt.; Agricultural Stations, 1 $\frac{3}{4}$ ozs.; Headquarters, 1 oz. |
| Peach, Clingstone ... | Kigoma, 1 pkt. |

SUGAR BEET:

| | |
|---|---|
| Kc 2, "B" strain ... | Mahenge, 34 pkts., Headquarters, 34 pkts. |
| Kc 3, "C" strain ... | Mahenge, 34, pkts.; Headquarters, 34 pkts. |
| Kurrajang (<i>Sterculia diversifolia</i>) ... | Agricultural Stations, 60 plants; Headquarters, 2 pkts. |
| Chillies | Tanga, 4 pkts.; Headquarters, 3 pkts. |
| <i>Prosopis juliflora</i> ... | Tanga, 1 pkt. |
| <i>Calopogonium mucunoides</i> | Tanga, 5 pkts. |
| <i>Crotalaria striata</i> ... | Tanga, 1 pkt. |
| <i>Pueraria thumbergiana</i> (Kudzuvine) ... | Tanga, 2 pkts.; Headquarters, 4 pkts. |
| <i>Hydnocarpus anthelmintica</i> | Tanga, 13 pkts. |
| Wightiana | Headquarters, 4 pkts. |
| <i>Passiflora foetida</i> ... | Agricultural Stations, 2 pkts. |
| <i>Passiflora edulis</i> (Jamaica var.) | } 1 pkt. each. |
| .. <i>ligularis</i> ... | |
| .. <i>mollisonica</i> ... | |
| .. <i>incarnata</i> ... | |
| .. <i>gracilis</i> ... | |
| Mountain Pawpaw (<i>Carica candamarcensis</i>) | } Headquarters. |
| Pecan Nut (<i>Carya olivaeformis</i>) ... | |
| <i>Cicer arietinum</i> (Chick Pea) | |
| <i>Perilla ocymoides</i> ... | |
| Locust or Carob Bean | |
| <i>Canarium commune</i> (Pili Nut) | |
| <i>Pentzia incana</i> (P. <i>virgata</i>) | |
| Date Palm | |

| | |
|---|-------------------|
| <i>Gossypium Stocksii</i> ... | 50 seeds |
| „ <i>berbaceum</i> , Lenn. ... | 1 pkt. |
| „ <i>berbaceum</i> , (Gurga) | 1 pkt. |
| Haiti Cotton ... | $\frac{1}{2}$ kg. |
| Santal (<i>Sandoricum</i> <i>koetjape</i>) ... | 10 seeds |
| Kikuyu Grass (<i>Pen-</i> <i>nisetum clandestini-</i> <i>num</i>) ... | 2 boxes runners |
| Karoo Bush (<i>Tetra-</i> <i>gonia arbuscuta</i>) ... | $\frac{1}{2}$ kg. |

GRASS SEEDS:

| | |
|-----------------------------------|---------------|
| <i>Panicum bulbosum</i> ... | 10 pkts. each |
| „ <i>floridum</i> ... | |
| „ <i>decomposi-</i> <i>tum</i> | |
| „ <i>antidotale</i> ... | |
| „ <i>frolutum</i> ... | |
| <i>Andropogon sericeus</i> | Headquarters. |
| „ <i>intermedius</i> | |
| <i>Erianthus fulvus</i> ... | |
| <i>Eragrostis curvula</i> ... | |
| <i>Astelba pectinata</i> ... | |

CLOVER:

| | |
|---|----------------------|
| Sweet ... | Iringa, 2 pkts. |
| Australian Sub- terranean | Iringa, 1 pkt. |
| Subterranean Clover (<i>Trifolium Sub-</i> <i>terraneum</i>) | 2 kgs. |
| Berseem or Egyptian Clover (<i>Trifolium</i> <i>alexandrinum</i>) ... | 2 kgs. |
| Bella Somba (<i>Phytolacca dioica</i>) | $\frac{1}{2}$ kg. |
| Drai Bos (<i>Tripteris</i> <i>leptoloba</i>) ... | 5 $\frac{1}{2}$ ozs. |
| Pyrethrum Seed (Swiss strain) ... | 3 pkts. |

APPENDIX II.

LIST OF SUB-STATIONS.

*With Special Economic Crops shown.**Central Province:*

| | | | | | |
|------------------|-----|---------------------|-----|------------|--------------------|
| SINGIDA DISTRICT | ... | Singida Sub-station | ... | Date Palm. | |
| | | Mkulusi | „ „ | ... | Date Palm. |
| MKALAMA DISTRICT | | Durumo | „ „ | ... | Coffee, Date Palm. |
| MANYONI DISTRICT | | Muhalala | „ „ | ... | Date Palm. |
| | | Maweni | „ „ | ... | Date Palm. |

Eastern Province:

| | | | |
|--------------------|----------------------|-----|------------------------|
| MOROGORO DISTRICT | Kinyenzi Sub-station | ... | Nil. |
| | Mkuyuni | „ „ | Coffee, Simsim. |
| | Dakawa | „ „ | Nil. |
| | Mvuha | „ „ | Nil. |
| | Matombo | „ „ | Coffee, Simsim. |
| | Diongoya | „ „ | Coffee, Cocoa, Simsim. |
| | Nurseries | „ „ | Coffee. |
| RUFJI DISTRICT ... | Rusende | „ „ | Nil. |
| | Kwangwasi | „ „ | Nil. |
| | Mohoro | „ „ | Nil. |
| | Mbwera | „ „ | Nil. |

Lindi Province:

| | | | | | |
|--------------------|-----|--------------------|-----|------|---------------------|
| LINDI DISTRICT | ... | Mnacho Sub-station | ... | Nil. | |
| | | Mwoa | „ „ | ... | Nil. |
| | | Madangwa | „ „ | ... | Nil. |
| MIKINDANI DISTRICT | | Mobambika | „ „ | ... | Groundnuts, Simsim. |
| NEWALA DISTRICT | ... | Matapwa | „ „ | ... | Groundnuts, Simsim. |
| MASASI DISTRICT | ... | Masasi | „ „ | ... | Nil. |
| KILWA DISTRICT | ... | Njinjo | „ „ | ... | Groundnuts. |
| | | Mhumba | „ „ | ... | Groundnuts. |
| | | Manzuri | „ „ | ... | Groundnuts. |
| | | Muhinji Chini | „ „ | ... | Groundnuts. |

Kigoma Province:

| | | | | | |
|------------------|-----|------------|-------------|------|---------|
| UFIPA DISTRICT | ... | Sumbawanga | Sub-station | Nil. | |
| KASULU DISTRICT | ... | Kasulu | „ | ... | Nil. |
| | | Nurseries | „ | ... | Coffee. |
| KIBONDO DISTRICT | ... | Nurseries | „ | ... | Coffee. |
| KIGOMA DISTRICT | ... | Karema | „ | ... | Nil. |

Tabora Province:

| | | | | |
|----------------|-----|--------------------|-----|-------------|
| NZEGA DISTRICT | ... | Mangoi Sub-station | ... | Groundnuts. |
| | | Nyama | „ „ | Groundnuts. |
| | | Ndala | „ „ | Groundnuts. |
| | | Nyawa | „ „ | Groundnuts. |

Iringa Province:

| | | | | |
|-----------------|-----|---------------------|-----|---------------------|
| IRINGA DISTRICT | ... | Kalenga Sub-station | ... | Groundnuts, Simsim. |
| NJOMBE DISTRICT | ... | Mdandu | „ „ | Groundnuts. |

Mahenge Province:

| | | |
|-----------------------|-------------------------|-------------------------------|
| MAHENGES DISTRICT ... | North Hanga Sub-station | Nil. |
| | Ifinga „ „ ... | Cocoa. |
| | Matumbi „ „ ... | Cocoa. |
| SONGEA DISTRICT ... | Lipumba „ „ ... | Coffee, Tobacco, Ground-nuts. |
| | Kindimba „ „ ... | Sugar Beet. |
| | Lituhi „ „ ... | Tobacco. |
| | Ndirima „ „ ... | Coffee, Groundnuts. |
| | Gumbiro „ „ ... | Coffee, Tobacco, Ground-nuts. |

Mwanza Province:

| | | |
|---------------------|--------------------------|-------------|
| MWANZA DISTRICT ... | Isanguja Sub-station ... | Nil. |
| KWIMBA DISTRICT ... | Ngudu „ „ ... | Nil. |
| MASWA DISTRICT ... | Shanwa „ „ ... | Groundnuts. |
| | Ntusu „ „ ... | Nil. |
| MUSOMA DISTRICT ... | Utimbaru „ „ ... | Coffee. |

Bukoba Province:

| | | |
|---------------------|-------------------------|---------|
| BUKOKA DISTRICT ... | Nyakato Sub-station ... | Coffee. |
| BIHARAMULO DISTRICT | Ntungamo „ „ ... | Nil. |
| | Nyamiaga „ „ ... | Coffee. |

Northern Province:

| | | |
|---------------------|------------------------|-------------|
| MOSHI DISTRICT ... | Usangi Sub-station ... | Groundnuts. |
| ARUSHA DISTRICT ... | Meru „ „ ... | Groundnuts. |

Tanga Province:

| | | |
|----------------------|------------------------|----------------------|
| TANGA DISTRICT ... | Muhesa Sub-station ... | Cocoa, Oil Palm. |
| USAMBARA DISTRICT | Lushoto „ „ ... | Nil. |
| | Mlalo „ „ ... | Nil. |
| PANGANI DISTRICT ... | Langoni „ „ ... | Groundnuts. |
| | Korokura „ „ ... | Tobacco, Groundnuts. |
| | Mavuno Mingi „ „ ... | Groundnuts. |
| | Nurseries „ „ ... | Coffee. |
| HANDENI DISTRICT ... | Chanika „ „ ... | Tobacco, Chillies. |
| | Magamba „ „ ... | Tobacco, Chillies. |
| | Vunira „ „ ... | Tobacco, Chillies. |
| | Mgara „ „ ... | Chillies. |
| | Kwekivu „ „ ... | Chillies. |

NOTE.—Details are not given regarding Food Crops as select varieties of these are cultivated at all sub-stations.

(Number of plots

| Place | | | | Seed-cotton | Maize | Groundnuts | Bambara Ground- nuts | Unhusked rice | Sorghum millet |
|---------------------|-----|-----|-----|-------------|-----------|------------|----------------------------|------------------|-------------------|
| <i>Rufiji :</i> | | | | | | | | | |
| Eastern | ... | ... | ... | 429 (6) | 992 (2) | — | — | 952 (16) | — |
| Central | ... | ... | ... | 332 (10) | 924 (1) | — | — | 1,049 (24) | 985 (11) |
| Western | ... | ... | ... | 809 (6) | 1,629 | 924 (1) | — | 2,017 (13) | 1,485 (10) |
| Northern hills | ... | ... | ... | — | — | — | — | 1,056 (1) | 1,144 (4) |
| <i>Morogoro :</i> | | | | | | | | | |
| Matombo | ... | ... | ... | — | 1,887 (3) | — | — | — | — |
| Mlali | ... | ... | ... | — | — | — | — | — | 470 (13) |
| Various | ... | ... | ... | — | — | — | — | 1,213 (37) | — |
| <i>Biharamulo :</i> | | | | | | | | | |
| Rusubi | ... | ... | ... | 620 (1) | 667 (2) | — | — | — | 523 (3) |
| Bugufi | ... | ... | ... | — | 1,064 (3) | — | — | — | — |
| <i>Mwanza :</i> | | | | | | | | | |
| Mwanza | ... | ... | ... | 261 (1) | 544 (1) | — | — | — | — |
| Uzinza | ... | ... | ... | 503 (5) | — | — | — | — | — |
| Island | ... | ... | ... | 535 (2) | — | — | — | — | — |
| Msalala | ... | ... | ... | 263 (1) | — | — | — | — | — |
| Isangija | ... | ... | ... | 242 (1) | — | — | — | — | — |
| Urima | ... | ... | ... | 421 (1) | — | — | — | — | 790 (1) |
| <i>Kwimba :</i> | | | | | | | | | |
| Magu | ... | ... | ... | 158 (2) | — | — | — | — | — |
| Usmau | ... | ... | ... | 305 (3) | 694 (1) | 504 (7) | — | — | 456 (1) |
| Nera | ... | ... | ... | 164 (2) | — | — | — | — | — |
| <i>Maswa :</i> | | | | | | | | | |
| Nassa | ... | ... | ... | 112 (1) | — | — | — | — | — |
| Shanwa | ... | ... | ... | — | 424 (1) | — | — | — | 442 (1) |
| <i>Shinyanga :</i> | | | | | | | | | |
| Ibadakuli | ... | ... | ... | 240 | 634 | 470 | — | — | — |
| Lubaga | ... | ... | ... | 320 | — | 560 | — | — | 1,500 |
| Shinyanga | ... | ... | ... | 170 | — | — | — | — | — |
| <i>Kibondo :</i> | | | | | | | | | |
| Kibondo | ... | ... | ... | — | 1,437 (2) | — | — | — | — |
| <i>Kasulu :</i> | | | | | | | | | |
| Kasulu | ... | ... | ... | — | 1,888 (1) | — | — | — | — |
| <i>Singida :</i> | | | | | | | | | |
| Wagogo | ... | ... | ... | — | — | 701 (10) | 352 (5) | 809 (4) | 528 (15) |
| Wanyiramba | ... | ... | ... | — | — | 733 (8) | 473 (3) | — | 567 (10) |
| Wanyaturu | ... | ... | ... | — | — | 702 (4) | 253 (1) | — | 433 (5) |

IN POUNDS PER ACRE

measured, in brackets).

| Simsim (Sesame) | Bulrush millet | Cowpeas | Pigeon pea | Gram | Donayist bean | Lima bean | Velvet bean | Tepary bean | Sugar bean |
|--------------------|-------------------|---------|---------------|---------|------------------|--------------|----------------|----------------|---------------|
| 319 (5) | — | — | — | — | — | — | — | — | — |
| 282 (9) | — | — | — | — | — | — | — | — | — |
| 792 (1) | — | — | 704 (1) | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | 493 (2) | — | — | 140 (1) | 164 (2) |
| — | — | — | — | — | 1,089 (2) | — | — | — | 922 (2) |
| — | — | — | — | 396 (1) | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — |
| — | 1,581 (1) | 480 (1) | — | — | — | — | — | — | 162 (1) |
| — | — | — | — | — | — | — | — | — | — |
| — | 1,890 (1) | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — |
| — | — | 320 (1) | — | — | — | — | — | — | — |
| 50 | — | 118 | 360 | — | 183 (2) | 167 | 412 | 425 | — |
| — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | 711 (2) | — | — | — |
| — | — | — | — | — | — | — | — | — | — |
| — | 517 (10) | — | — | — | — | — | — | — | — |
| — | 405 (5) | — | — | — | — | — | — | — | — |
| — | 559 (5) | — | — | — | — | — | — | — | — |

APPENDIX IV. LIST OF GINNERIES EXISTING IN 1928-29.

| Province and District | Locality | Number of Gins | | Licensee |
|-----------------------|-------------------|----------------|--------|---------------------------|
| | | Saw | Roller | |
| <i>Eastern :</i> | | | | |
| Dar es Salaam ... | Dar es Salaam ... | 1 | 16 | Liverpool Uganda Co. |
| " | Pagu ... | 1 | 18 | Abdulrasul & Sons |
| Morogoro ... | Morogoro ... | — | 28 | Tanganyika Cotton Co. |
| " | Mikese ... | 3 | 19 | Japan Cotton Trading Co. |
| " | Ngerengere ... | 1 | 7 | Liverpool Uganda Co. |
| " | Mlali ... | — | 18 | Tanganyika Cotton Co. |
| " | Duthumi ... | 1 | 8 | Tanganyika Cotton Co. |
| Kilosa... .. | Kilosa ... | — | 14 | Rosehaugh & Co. |
| " | Rudewa ... | — | 20 | Tanganyika Cotton Co. |
| " | Mkata ... | — | 12 | Tanganyika Cotton Co. |
| " | Turiani ... | — | 6 | Tanganyika Cotton Co. |
| " | Msowero ... | — | 6 | Kladites and Samaris |
| Bagamoyo ... | Bagamoyo ... | 1 | 8 | Holy Ghost Mission |
| " | Kisauke ... | — | 2 | S. G. Drosopoulos |
| Rufiji ... | Betya† ... | — | 16 | Rosehaugh & Co. |
| " | Kilimani ... | — | 12 | Kilimani Estates |
| " | Logeloge ... | — | 6 | Logeloge Estates |
| <i>Lindi :</i> | | | | |
| Lindi ... | Lindi ... | — | 12 | Mathuradas Kalidas |
| " | Lindi† ... | — | 14 | Rosehaugh & Co. |
| Kilwa ... | Kikanda ... | — | 8 | Jaffer Samji & Co. |
| <i>Tanga :</i> | | | | |
| Tanga ... | Tongoni† ... | 1 | 10 | G. Galanos |
| Pangani ... | Langoni ... | 1 | — | Kwashesmzi Estates |
| Handeni ... | Mamundu ... | 1 | — | Kwashesmzi Estates |
| Usambara ... | Kwashesmzi† ... | 2 | — | Kwashesmzi Estates |
| <i>Northern :</i> | | | | |
| Moshi... .. | Moshi... .. | — | 6 | N. Dadani |
| " | Himo ... | 1 | 12 | Shariff Jiwa & Co. |
| " | Himo* ... | — | 2 | A. Mongardi |
| " | Himo* ... | 1 | 1 | F. Deusebis |
| Mbulu ... | Idulu† ... | — | 5 | M. Michaelakis |
| <i>Tabora :</i> | | | | |
| Shinyanga ... | Usogore ... | 4 | — | B.E.A. Corporation |
| Shinyanga ... | Luhombo ... | 4 | — | B.E.A. Corporation |
| <i>Mwanza :</i> | | | | |
| Mwanza ... | Mwanza ... | — | 16 | Nakasero Trading Co. |
| " | Murutunguru ... | 1 | 10 | White Fathers' Mission |
| " | Ihale ... | — | 11 | Mwanza Cotton Trading Co. |
| " | Bukumbi ... | — | 14 | Bhagwanji Sunderji & Co. |
| Kwimba ... | Nyambiti ... | 2 | 6 | B.C.G. Association |
| " | Nyanguge ... | 2 | 5 | B.C.G. Association |
| " | Pambani ... | — | 11 | Kampala General Agency |
| " | Runere ... | 5 | — | B.E.A. Corporation |
| Maswa ... | Malampaka ... | 5 | — | B.E.A. Corporation |
| " | Nasa ... | — | 12 | Narandas Rajaram & Co. |
| <i>Bukoba :</i> | | | | |
| Biharamulo ... | Biharamulo ... | 2 | — | B.C.G. Association |

*Private ginneries. †Not licensed in 1928-29.

APPENDIX V.

REVENUE, FINANCIAL YEARS 1927-28, 1928-29.

| | 1927-28 | | 1928-29 | |
|--|-----------|-------------|-----------|-------------|
| | Shs. | Total, Shs. | Shs. | Total, Shs. |
| Receipts from Government Plantations:— | | | | |
| Bagamoyo | 15,211·03 | | 15,896·00 | |
| Dar es Salaam (including Mafia) | 25,398·02 | | 17,413·78 | |
| Dodoma | 50·00 | | 40·00 | |
| Kasanga | 146·00 | | 392·00 | |
| Kigoma | 733·05 | | 574·00 | |
| Kilwa | 210·00 | | 391·50 | |
| Kilosa | 392·00 | | 353·00 | |
| Lindi | 150·00 | | 450·00 | |
| Lushoto | 205·00 | | Nil | |
| Mahenge | 102·00 | | 121·00 | |
| Miombo Government Farm ... | 1,000·00 | | 1,000·00 | |
| Mikindani | 181·00 | | 6,568·69 | |
| Morogoro | 952·80 | | 2,699·49 | |
| Mwanza | 564·68 | | 155·37 | |
| Pangani | 1,545·12 | | 1,613·22 | |
| Tabora | 748·95 | | 605·00 | |
| Tanga | 25,217·00 | | 9,933·00 | |
| Utete | 639·50 | | 992·75 | |
| | | 73,446·15 | | 59,198·80 |
| Miscellaneous Sales of Produce and Planting Material:— | | | | |
| Morogoro Agricultural Station ... | 3,630·20 | | 2,445·00 | |
| Mpanganya Agricultural Station | 1,333·46 | | 769·65 | |
| Ibadakuli Agricultural Station ... | Nil | | 357·32 | |
| Botanic Gardens, Dar es Salaam | 59·50 | | 54·50 | |
| Headquarters Office | 245·00 | | 18·90 | |
| | | 5,268·16 | | 3,645·37 |
| Total ... | | 78,714·31 | | 62,844·17 |

APPENDIX VI. TANGANYIKA TERRITORY.—PRINCIPAL EXPORTS, 1913 AND 1924-25-26-27-28.

| Export | 1913 | | | | 1924 | | | | 1925 | | | |
|-----------------------|-------------------|------------|-----------------------------|-------|-------------------|------------|-----------------------------|-------|-------------------|------------|-----------------------------|-------|
| | Quantity Cwts. | Value £ | Per cent. of Total Value | Order | Quantity Cwts. | Value £ | Per cent. of Total Value | Order | Quantity Cwts. | Value £ | Per cent. of Total Value | Order |
| Sisal | 416,680 | 535,580 | 30.1 | I | 398,560 | 644,855 | 24.7 | I | 305,520 | 688,431 | 22.9 | I |
| Hides and Skins ... | 69,420 | 274,511 | 15.4 | III | 50,948 | 185,843 | 7.1 | V | 53,225 | 240,165 | 8.0 | IV |
| Cotton | 43,840 | 120,753 | 6.7 | IV | 50,828 | 373,753 | 14.3 | II | 90,043 | 540,481 | 18.0 | II |
| Copra | 109,540 | 117,401 | 6.6 | V | 182,500 | 178,194 | 6.8 | VI | 152,460 | 160,800 | 5.3 | VI |
| Groundnuts | 179,220 | 95,932 | 5.3 | VI | 373,680 | 339,918 | 13.8 | III | 181,100 | 178,685 | 5.9 | V |
| Beeswax | 11,180 | 70,733 | 4.0 | VII | 8,197 | 41,606 | 1.7 | X | 5,858 | 42,755 | 1.4 | X |
| Coffee | 21,180 | 46,563 | 2.6 | VIII | 105,222 | 352,529 | 13.5 | IV | 120,186 | 481,055 | 16.0 | III |
| Shesim | 29,520 | 20,407 | 1.1 | XI | 78,180 | 80,324 | 3.1 | VII | 67,920 | 71,561 | 2.4 | VII |
| Rice | 15,420 | 8,717 | 0.5 | — | 62,255 | 59,866 | 2.3 | VIII | 60,921 | 62,232 | 2.1 | VIII |
| Millet | 18,210 | 5,498 | 0.3 | — | 158,332 | 49,976 | 1.9 | IX | 66,581 | 25,517 | 0.8 | — |
| Total | 913,910 | 1,296,105 | 72.6 | — | 1,418,932 | 2,339,904 | 89.2 | — | 1,163,764 | 2,491,702 | 82.8 | — |
| Plantation Rubber ... | 25,740 | 309,195 | 17.5 | II | — | — | — | — | 7,520 | 49,794 | 1.6 | IX |
| Ghee | 6,656 | 15,400 | 0.8 | X | — | — | — | — | 7,658 | 33,770 | 1.1 | — |
| Cotton Seed | — | — | — | — | — | — | — | — | 86,980 | 32,560 | 1.1 | — |

| Export | 1926 | | | | 1927 | | | | 1928 | | | |
|-----------------------|-------------------|------------|-----------------------------|-------|-------------------|------------|-----------------------------|-------|-------------------|------------|-----------------------------|-------|
| | Quantity Cwts. | Value £ | Per cent. of Total Value | Order | Quantity Cwts. | Value £ | Per cent. of Total Value | Order | Quantity Cwts. | Value £ | Per cent. of Total Value | Order |
| Sisal | 500,400 | 911,293 | 29.1 | I | 660,240 | 1,160,735 | 33.7 | I | 723,720 | 1,111,129 | 27.1 | I |
| Hides and Skins ... | 41,907 | 164,455 | 5.3 | V | 55,802 | 238,890 | 7.0 | IV | 65,848 | 374,830 | 9.3 | IV |
| Cotton | 97,723 | 427,437 | 13.7 | III | 78,814 | 361,916 | 10.5 | III | 97,863 | 495,405 | 12.2 | III |
| Copra | 146,960 | 152,228 | 4.9 | VI | 145,340 | 143,024 | 4.2 | VI | 156,360 | 131,197 | 4.7 | V |
| Groundnuts | 317,340 | 151,903 | 8.1 | IV | 282,940 | 238,082 | 6.9 | V | 211,900 | 188,582 | 4.7 | VI |
| Beeswax | 6,147 | 48,179 | 1.5 | IX | 11,169 | 80,863 | 2.4 | VII | 9,815 | 71,079 | 1.7 | VIII |
| Coffee | 130,793 | 495,199 | 15.8 | II | 131,899 | 465,420 | 13.5 | II | 298,622 | 739,657 | 18.3 | II |
| Shesim | 71,260 | 68,585 | 2.2 | VII | 74,660 | 74,017 | 2.2 | VIII | 64,300 | 61,342 | 1.5 | IX |
| Rice | 65,255 | 57,564 | 1.8 | VIII | 78,820 | 72,253 | 2.1 | IX | 79,973 | 85,884 | 2.1 | VII |
| Millet | 58,126 | 24,094 | 0.8 | — | 72,268 | 25,161 | 0.9 | X | 151,636 | 52,913 | 1.3 | X |
| Total | 1,435,951 | 2,603,917 | 83.2 | — | 1,591,952 | 2,862,361 | 83.4 | — | 1,893,037 | 3,371,614 | 83.2 | — |
| Plantation Rubber ... | 7,151 | 41,310 | 1.3 | X | 1,738 | 7,065 | 0.2 | — | 673 | 3,008 | 0.1 | — |
| Ghee | 7,428 | 32,577 | 1.0 | — | 7,912 | 30,015 | 0.9 | X | 10,002 | 37,924 | 0.9 | — |
| Cotton Seed | 105,900 | 22,185 | 0.7 | — | 91,320 | 18,440 | 0.5 | — | 139,240 | 33,099 | 0.8 | — |

APPENDIX VIII (A). TANGANYIKA TERRITORY.—RAINFALL IN MILLIMETRES, 1928.

| Province | District | Station | Alt. Feet | Lat. S | Long. E | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|----------|--------------|------------------|--------------|-----------|------------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|---------|
| Eastern | Dares Salaam | Dar es Salaam | 30 | 6°50' | 39°17' | 29.3 | 4.3 | 128.1 | 349.8 | 161.1 | 118.3 | 1.6 | 30.9 | 17.4 | 8.4 | 110.8 | 18.0 | 978.0 |
| | Maha | Utumani | 63 | 7°55' | 39°45' | 133.3 | 72.8 | 429.3 | 633.2 | 572.1 | 106.6 | 18.0 | 16.3 | 6.3 | 6.1 | 31.7 | 73.8 | 2,039.5 |
| | " | Msimbazi Miss. | — | 6°50' | 39°17' | 23.5 | 8.7 | 83.6 | 285.9 | 170.9 | 151.0 | 2.4 | 15.1 | 3.8 | 3.3 | 127.9 | 11.1 | 887.2 |
| | " | Ruvu | — | 6°48' | 38°45' | 38.0 | 49.5 | 44.0 | 195.0 | 109.0 | 51.0 | 0.0 | 5.5 | 8.0 | 43.0 | 206.0 | 13.0 | 762.0 |
| | " | Soga | — | — | — | 131.1 | 14.2 | 164.1 | 201.1 | 157.7 | 88.4 | 0.0 | 3.1 | 23.1 | 30.7 | 134.1 | 23.1 | 1,060.7 |
| | Morogoro | Morogoro | 1,628 | 6°48' | 37°01' | 7.9 | 57.2 | 76.8 | 214.8 | 127.4 | 24.3 | 0.5 | 27.4 | 0.3 | 79.6 | 55.5 | 54.0 | 726.2 |
| | " | Turiani | 1,341 | — | — | 94.7 | 114.6 | 276.4 | 305.5 | 147.2 | 46.1 | 0.8 | 8.4 | 0.0 | 29.4 | 82.4 | 15.0 | 1,120.5 |
| | " | Bunduki | 5,300 | — | — | 254.4 | 119.0 | 508.8 | 652.6 | 297.2 | 150.2 | 0.0 | 80.0 | 110.1 | 186.4 | 504.6 | 343.5 | 3,203.4 |
| | " | Ngeerenge | 1,641 | 6°47' | 38°08' | 7.5 | 154.7 | 53.4 | 204.2 | 111.6 | 66.1 | 0.0 | 14.0 | 9.0 | 43.7 | 126.5 | 28.7 | 813.4 |
| | Kilosa | Kilosa | 1,606 | 6°48' | 37°46' | 151.1 | 160.9 | 149.6 | 242.5 | 43.6 | 25.8 | 0.0 | 0.0 | 15.4 | 17.6 | 95.3 | 163.1 | 1,065.6 |
| Central | Bugumoyo | Bugumoyo | 8.1. | 6°25' | 38°55' | 22.5 | 38.2 | 142.0 | 238.4 | 90.2 | 144.0 | 2.0 | 25.0 | 10.0 | 9.0 | 113.5 | 34.0 | 1,017.0 |
| | Utete | Utete | — | — | — | 8.0 | 32.2 | 142.0 | 238.4 | 90.2 | 144.0 | 2.0 | 0.4 | 29.0 | 27.7 | 80.2 | 80.2 | 732.7 |
| | Mpunganya | Mpunganya | 105 | — | — | 53.1 | 51.9 | 116.8 | 162.6 | 67.3 | 13.0 | 0.0 | 12.4 | 26.9 | 2.6 | 95.7 | 28.9 | 631.2 |
| | Dodoma | Dodoma | 1,120 | 6°11' | 35°46' | 13.5 | 66.0 | 90.1 | 35.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.0 | 0.0 | 144.8 | 383.5 |
| | " | Mpwapwa | — | — | — | 61.8 | 86.2 | 157.8 | 30.8 | 52.2 | 3.0 | 0.0 | 0.0 | 0.0 | 24.2 | 20.2 | 66.0 | 502.2 |
| | " | Bingili | — | — | — | 40.6 | 156.5 | 46.2 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 25.1 | 7.6 | 135.9 | 433.0 |
| | Manroni | Manroni | 3,000 | 6°00' | 36°00' | 69.0 | 56.9 | 135.7 | 76.2 | 24.5 | 0.0 | 0.0 | 0.0 | 0.0 | 9.1 | 0.0 | 227.9 | 539.3 |
| | Singida | Singida | 5,233 | 4°48' | 34°45' | 74.3 | 126.1 | 144.2 | 31.1 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 68.2 | 10.1 | 172.2 | 630.4 |
| | Kondou | Kondou | 3,500 | 5°00' | 35°00' | 42.7 | 98.3 | 129.8 | 26.8 | 30.5 | 0.0 | 0.0 | 0.0 | 0.0 | 26.7 | 0.0 | 177.3 | 532.1 |
| | " | Kondou | 4,610 | 4°57' | 35°38' | 4.0 | 63.7 | 115.1 | 61.1 | 34.0 | 2.1 | 0.0 | 0.0 | 0.0 | 2.3 | 1.5 | 94.9 | 378.7 |
| Tabora | Mkalama | Kwa Mtoro Miss. | 4,444 | 5°06' | 35°36' | 14.7 | 144.4 | 151.1 | 95.5 | 49.5 | 7.9 | 0.0 | 0.0 | 0.0 | 26.0 | 6.7 | 237.8 | 733.6 |
| | " | Mkalama | 4,235 | 4°00' | 35°00' | 33.0 | 128.1 | 158.0 | 163.0 | 24.0 | 11.0 | 0.0 | 0.0 | 10.0 | 52.1 | 26.0 | 94.0 | 701.2 |
| | Tabora | Tabora | 4,000 | 5°00' | 32°00' | 133.5 | 121.5 | 233.0 | 204.0 | 36.5 | 0.0 | 0.0 | 0.0 | 4.5 | 13.5 | 21.7 | 203.0 | 971.2 |
| | Kahama | Kahama | 4,055 | 3°35' | 32°33' | 68.7 | 71.9 | 158.4 | 71.1 | 0.0 | 0.0 | 3.0 | 0.0 | 3.8 | 89.3 | 31.8 | 199.3 | 715.3 |
| | " | Ushrombo | — | — | — | 53.6 | 126.6 | 151.5 | 146.3 | 65.7 | 0.9 | 0.0 | 12.1 | 14.7 | 80.1 | 78.9 | 88.6 | 819.0 |
| | Shinyanga | Kola Ndota Miss. | 4,000 | 3°34' | 33°19' | 128.6 | 128.9 | 291.3 | 168.3 | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.0 | 48.2 | 134.1 | 994.4 |
| | " | Lolumbo Miss. | 4,400 | 4°00' | 33°19' | 78.2 | 249.4 | 129.0 | 199.6 | 26.8 | 1.6 | 0.0 | 14.9 | 60.2 | 46.8 | 45.8 | 143.1 | 948.6 |
| | Nzega | Nzega | 4,000 | 4°15' | 33°08' | 57.1 | 107.6 | 149.6 | 147.0 | 26.0 | 0.0 | 0.0 | 0.0 | 3.4 | 58.4 | 74.4 | 214.1 | 837.6 |
| | " | Ibadakuli | — | — | — | 88.3 | 182.7 | 252.0 | 96.3 | 23.5 | 0.0 | 16.0 | 0.0 | 0.0 | 77.2 | 62.6 | 198.0 | 995.6 |
| | Shinyanga | Kigoma | 2,531 | 4°52' | 29°28' | 47.9 | 149.6 | 72.5 | 150.5 | 44.5 | 0.0 | 0.0 | 0.0 | 0.0 | 5.5 | 75.9 | 119.6 | 660.0 |
| Kigoma | " | Kigoma | — | — | — | 113.9 | 92.3 | 134.0 | 123.1 | 55.9 | 2.4 | 0.0 | 0.0 | 0.0 | 14.3 | 31.8 | 144.7 | 712.4 |
| | " | Taji | 2,738 | 4°39' | 29°47' | 138.9 | 145.0 | 121.7 | 237.8 | 84.0 | 2.8 | 1.0 | 0.0 | 30.0 | 81.8 | 84.8 | 179.8 | 1,021.5 |
| | " | Kasulu | 4,520 | 4°35' | 30°07' | 50.8 | 145.0 | 121.7 | 237.8 | 91.9 | 17.2 | 0.0 | 10.0 | 31.0 | 96.3 | 137.8 | 121.1 | 1,655.6 |
| | " | Kilondo | 4,988 | 3°34' | 30°42' | 104.7 | 66.9 | 183.9 | 191.6 | 94.9 | 0.3 | 0.0 | 0.0 | 41.0 | 41.0 | 35.8 | 109.2 | 615.9 |
| | " | Uvinza | 3,300 | 5°06' | 30°28' | 65.0 | 131.0 | 109.5 | 68.8 | 14.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 100.0 | 176.2 | 1,125.1 |
| | " | Kate Mission | 5,700 | 7°52' | 31°13' | 130.8 | 198.9 | 816.2 | 78.0 | 70.6 | 7.4 | 0.0 | 2.0 | 45.8 | 0.0 | 100.0 | 176.2 | 1,125.1 |
| | Ufipa | Kulu Mission | 2,700 | 8°09' | 30°59' | 26.2 | 198.5 | 121.9 | 74.2 | 7.6 | 0.0 | 0.0 | 0.5 | 0.0 | 13.2 | 112.8 | 355.6 | 900.5 |

APPENDIX VIII (A).—(contd.)

TANGANYIKA TERRITORY.—RAINFALL IN MILLIMETRES, 1928.—(contd.)

| Province | District | Station | Alt. Feet | Lat. S | Long. E | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|----------|-----------|------------------|--------------|-----------|------------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|---------|
| Kigoma | Ufipa | Mulera ... | 4,700 | 4°25' | 29°57' | 165.5 | 169.3 | 341.5 | 271.2 | 92.6 | 0.4 | 1.8 | 0.0 | 35.9 | 123.4 | 117.5 | 214.7 | 1,533.8 |
| | " | Rungwa... | 2,950 | 7°17' | 31°41' | 68.7 | 97.8 | 167.9 | 71.9 | 55.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.5 | 96.5 | 575.9 |
| | Lindi | Lindi ... | S.L. | 10°00' | 39°43' | 274.8 | 126.8 | 162.8 | 122.0 | 18.6 | 14.2 | 0.0 | 0.0 | 5.7 | 21.0 | 32.0 | 216.5 | 994.4 |
| | " | Tunduru | 2,300 | 11°05' | 37°27' | 256.6 | 152.3 | 234.6 | 42.0 | 18.0 | 0.0 | 0.0 | 0.0 | 3.5 | 4.0 | 5.1 | 168.1 | 854.2 |
| Masasi | " | Masasi Mission | 1,500 | 10°42' | 38°53' | 119.9 | 123.7 | 300.1 | 113.8 | 30.5 | 0.0 | 0.0 | 0.0 | 1.4 | 38.0 | 33.2 | 71.6 | 832.3 |
| | " | Ndanda Mission | 934 | 10°28' | 39°04' | 142.1 | 207.6 | 255.7 | 131.8 | 28.4 | 2.5 | 0.0 | 1.2 | 4.6 | 20.6 | 11.3 | 91.8 | 900.6 |
| | Mikindani | Mikindani | 1,016 | 31°00' | 40°07' | 239.3 | 117.6 | 133.4 | 92.6 | 71.3 | 10.7 | 0.0 | 0.0 | 0.0 | 1.2 | 17.4 | 78.2 | 752.4 |
| | Lindi | Lindi ... | 1,196 | 10°04' | 39°39' | 222.3 | 216.8 | 151.5 | 111.8 | 22.3 | 3.5 | 0.3 | 7.8 | 0.0 | 4.0 | 62.1 | 47.2 | 741.9 |
| Kilwa | " | Mingoyo | S.L. | 8°57' | 39°24' | 119.0 | 106.6 | 125.3 | 48.0 | 59.7 | 9.4 | 0.0 | 5.4 | 19.1 | 8.0 | 24.1 | 126.2 | 865.5 |
| | " | Kilwa ... | 1,500 | 9°45' | 38°00' | 125.7 | 192.0 | 287.1 | 186.8 | 30.5 | 0.0 | 0.0 | 1.2 | 0.0 | 19.2 | 24.8 | 126.2 | 865.5 |
| | " | Liwale ... | S.L. | 8°30' | 39°15' | 95.1 | 120.2 | 166.6 | 144.7 | 71.0 | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 | 82.0 | 57.0 | 716.0 |
| | " | Kikanda | 1,400 | 8°50' | 39°00' | 212.4 | 133.2 | 423.0 | 319.0 | 118.0 | 148.6 | 0.0 | 8.0 | 70.4 | 15.8 | 148.0 | 274.2 | 1,737.0 |
| Tanga | " | Kibata ... | S.L. | 5°40' | 39°07' | 26.8 | 32.1 | 92.5 | 170.7 | 406.3 | 104.6 | 5.0 | 65.8 | 49.2 | 20.0 | 361.7 | 44.6 | 1,423.3 |
| | " | Tanga ... | 360 | 5°10' | 38°47' | 64.3 | 0.0 | 86.4 | 182.6 | 225.0 | 134.3 | 66.8 | 50.5 | 53.5 | 121.4 | 429.2 | 230.1 | 2,320.1 |
| | " | Muhesa ... | 3,004 | 3°06' | 38°38' | 56.9 | 3.5 | 298.3 | 424.8 | 379.4 | 88.0 | 3.7 | 135.6 | 53.5 | 79.2 | 129.6 | 48.9 | 1,570.7 |
| | Usambara | Amami ... | 4,590 | 4°48' | 38°18' | 59.5 | 41.7 | 200.6 | 393.5 | 495.0 | 272.8 | 2.5 | 118.6 | 30.5 | 50.0 | 282.5 | 67.3 | 2,320.8 |
| " | " | Lushoto... | 4,590 | 5°00' | 38°05' | 38.4 | 30.0 | 157.0 | 549.4 | 716.8 | 202.4 | 2.0 | 91.5 | 24.9 | 31.8 | 310.0 | 22.8 | 1,974.5 |
| | " | Sakare Cottage | 4,500 | 5°00' | 38°26' | 87.6 | 52.3 | 197.6 | 415.8 | 532.4 | 13.2 | 0.0 | 0.0 | 0.0 | 45.2 | 53.5 | 237.8 | 852.3 |
| | " | Sakare Ngarya... | 3,470 | 5°00' | 38°26' | 96.3 | 42.1 | 137.3 | 120.8 | 106.3 | 53.0 | 0.0 | 0.0 | 1.6 | 136.1 | 184.5 | 468.5 | 1,639.4 |
| | " | Suji Mission | 5,600 | 4°20' | 37°51' | 96.3 | 137.0 | 184.0 | 179.8 | 142.3 | 53.0 | 1.4 | 52.0 | 10.6 | 7.3 | 501.6 | 35.4 | 1,197.3 |
| " | " | Mlalo ... | 3,900 | 4°36' | 38°23' | 112.6 | 137.0 | 103.4 | 641.8 | 798.1 | 263.2 | 2.2 | 152.5 | 35.8 | 62.1 | 373.4 | 6.6 | 2,617.0 |
| | " | Mtotohoru | 35 | 4°32' | 39°10' | 22.6 | 66.5 | 187.6 | 151.8 | 798.1 | 263.2 | 2.8 | 87.9 | 18.3 | 30.2 | 227.3 | 78.7 | 1,625.1 |
| | " | Ambangulu | 3,650 | 5°06' | 38°28' | 27.2 | 34.3 | 142.6 | 352.0 | 397.7 | 125.2 | 0.0 | 71.6 | 1.4 | 27.6 | 206.8 | 28.4 | 1,219.6 |
| | " | Musasa ... | 3,750 | 5°00' | 38°26' | 21.1 | 34.3 | 142.6 | 352.0 | 397.7 | 125.2 | 0.0 | 71.6 | 1.4 | 27.6 | 206.8 | 28.4 | 1,219.6 |
| Pangani | " | Korogwe | 959 | 5°10' | 38°28' | 26.8 | 36.2 | 119.1 | 287.7 | 293.4 | 127.8 | 13.4 | 20.6 | 24.0 | 23.6 | 340.2 | 10.4 | 1,131.8 |
| | " | Pangani | S.L. | 5°27' | 39°00' | 41.8 | 1.2 | 99.0 | 231.3 | 223.8 | 93.0 | 0.0 | 10.7 | 11.9 | 32.7 | 92.1 | 57.2 | 747.4 |
| | " | Handeni | 2,200 | 5°00' | 38°00' | 6.0 | 28.7 | 100.5 | 160.0 | 129.4 | 118.2 | 15.5 | 42.1 | 39.8 | 95.0 | 155.4 | 102.3 | 1,492.8 |
| | " | Lolungo Estate | 3,900 | 5°30' | 37°33' | 45.6 | 82.3 | 191.1 | 335.6 | 288.4 | 99.7 | 0.0 | 18.5 | 8.9 | 39.6 | 55.0 | 26.9 | 1,204.1 |
| Northern | " | Moshi | 2,649 | 3°22' | 37°29' | 13.4 | 8.4 | 91.2 | 714.6 | 167.6 | 59.8 | 0.0 | 71.0 | 99.0 | 55.0 | 131.6 | 165.1 | 2,044.8 |
| | " | Kilema Mission | 4,703 | 3°19' | 37°29' | 165.0 | 68.3 | 170.5 | 646.6 | 368.7 | 104.0 | 5.5 | 49.5 | 15.0 | 5.0 | 122.5 | 12.0 | 1,699.5 |
| | " | Mweka Estate | 5,000 | 3°01' | 37°03' | 103.8 | 39.9 | 71.7 | 174.8 | 135.1 | 14.9 | 0.0 | 0.0 | 0.6 | 5.0 | 180.8 | 68.8 | 831.5 |
| | " | Ngaire-Nairobi | 4,416 | 3°23' | 37°43' | 33.2 | 80.6 | 59.0 | 264.4 | 245.7 | 91.5 | 0.0 | 3.0 | 4.8 | 48.6 | 98.6 | 43.5 | 982.9 |
| Mwanza | Arusha | Arusha ... | — | — | — | 24.4 | 54.0 | 84.8 | 192.8 | 138.2 | 38.6 | 0.0 | 0.0 | 1.0 | 27.3 | 37.8 | 20.6 | 619.5 |
| | " | Engare-Oluotanyi | — | — | — | 44.1 | 46.3 | 224.9 | 272.0 | 59.6 | 26.0 | 0.0 | 0.0 | 0.0 | 66.0 | 214.0 | 69.5 | 977.4 |
| | Mbulu | Mbulu ... | 5,900 | 3°52' | 35°37' | 56.5 | 70.0 | 66.5 | 191.0 | 138.6 | 2.1 | 29.5 | 31.5 | 41.7 | 42.5 | 89.3 | 115.7 | 868.9 |
| | Mwanza | Mwanza ... | 3,709 | 3°32' | 32°53' | 56.5 | 70.0 | 66.5 | 191.0 | 138.6 | 2.1 | 29.5 | 31.5 | 41.7 | 42.5 | 89.3 | 115.7 | 868.9 |
| " | " | Marutunguru M. | 1,134 | 2°00' | 33°20' | 72.1 | 174.3 | 115.3 | 296.4 | 267.0 | 10.4 | 0.0 | 81.0 | 17.1 | 28.8 | 99.9 | 137.9 | 1,300.2 |

APPENDIX VIII (A).—(contd.) TANGANYIKA TERRITORY—RAINFALL IN MILLIMETRES, 1928.—(contd.).

| Province | District | Station | Alt. Feet | Lat. S | Long. E | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|----------|-----------|------------------|--------------|-----------|------------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|---------|---------|
| Mwanza | Mwanza | Kone Mission ... | 3,800 | 2°25' | 32°28' | 12.0 | 67.0 | 131.0 | 224.0 | 85.0 | 12.0 | 24.0 | 25.0 | 84.0 | 160.0 | 119.0 | 115.0 | 1,058.0 |
| | Musoma | Musoma ... | 3,709 | 1°28' | 33°47' | 25.2 | 34.0 | 22.4 | 142.4 | 137.2 | 11.6 | 9.5 | 23.3 | 9.7 | 108.1 | 22.7 | 21.5 | 567.6 |
| | Maswa | Maswa ... | 4,400 | 3°10' | 33°40' | 67.1 | 136.4 | 207.2 | 111.4 | 19.2 | 3.0 | 0.0 | 0.0 | 21.8 | 56.8 | 37.6 | 177.3 | 887.8 |
| | Kwimba | Somvi Mission... | 4,100 | 2°40' | 33°10' | 37.6 | 39.8 | 46.3 | 100.4 | 54.1 | 0.0 | 7.9 | 0.0 | 12.5 | 10.1 | 79.8 | 54.6 | 513.6 |
| Bukoba | " | Kijima ... | 3,750 | 3°50' | 44°10' | 51.1 | 114.5 | 121.3 | 200.0 | 46.5 | 2.0 | 12.6 | 0.0 | 21.2 | 111.2 | 43.2 | 94.1 | 817.7 |
| | " | Bukoba ... | 3,709 | 1°20' | 31°47' | 75.9 | 241.7 | 255.4 | 380.1 | 43.1 | 126.2 | 42.9 | 79.2 | 114.8 | 111.7 | 138.3 | 144.1 | 2,241.7 |
| | " | Kagondo Mission | 4,252 | 1°18' | 31°15' | 94.8 | 148.6 | 345.2 | 311.3 | 360.7 | 113.9 | 19.2 | 59.5 | 58.5 | 115.1 | 97.8 | 174.6 | 1,939.2 |
| | Bihamulo | Bihamulo | 4,350 | 2°42' | 31°26' | 54.6 | 116.0 | 74.9 | 187.4 | 111.0 | 0.0 | 11.6 | 3.0 | 23.0 | 29.5 | 56.6 | 97.8 | 765.4 |
| Mahenge | Mahenge | Mahenge ... | — | — | — | 57.5 | 138.5 | 299.8 | 138.8 | 65.7 | 21.0 | 0.0 | 0.0 | 5.0 | 68.2 | 0.0 | 175.8 | 970.5 |
| | " | Itakara Mission | — | — | — | 66.6 | 118.0 | 321.0 | 210.0 | 90.8 | 25.6 | 0.0 | 7.5 | 36.1 | 36.4 | 35.6 | 150.0 | 1,097.6 |
| Iringa | " | Songea ... | 3,826 | 10°42' | 35°40' | 121.8 | 357.6 | 485.2 | 81.6 | 5.7 | 2.3 | 0.0 | 0.0 | 0.0 | 37.0 | 1.8 | 134.5 | 716.0 |
| | " | Iringa ... | 5,365 | 7°43' | 35°37' | 56.1 | 186.5 | 247.4 | 51.2 | 1.2 | 0.3 | 0.0 | 0.0 | 0.0 | 91.4 | 36.5 | 89.4 | 893.7 |
| | " | Fikula Farm ... | 5,640 | 8°06' | 35°20' | 100.3 | 327.6 | 209.6 | 36.6 | 0.3 | 1.0 | 0.0 | 0.0 | 1.0 | 91.4 | 36.5 | 89.4 | 893.7 |
| | " | Dabaga ... | 6,435 | 8°02' | 35°42' | 128.8 | 163.0 | 174.3 | 196.5 | 162.9 | 35.1 | 0.5 | 13.9 | 25.7 | 42.7 | 28.8 | 121.6 | 1,094.7 |
| Rungwe | " | Njombe ... | 6,400 | — | — | 128.0 | 216.0 | 509.8 | 72.6 | 5.8 | 2.2 | 0.0 | 0.0 | 1.1 | 15.5 | 22.9 | 243.6 | 1,217.5 |
| | " | Milo ... | 6,500 | 9°52' | 34°37' | 180.0 | 243.1 | 349.4 | 181.3 | 95.8 | 5.8 | 0.0 | 1.0 | 0.0 | 40.5 | — | 208.5 | — |
| | " | Lapembe ... | 5,000 | 9°00' | 35°30' | 105.9 | 257.4 | 293.4 | 229.7 | 38.5 | 13.0 | 0.0 | 10.5 | 37.5 | 17.9 | 120.9 | 147.9 | 1,272.6 |
| | " | Tukuyu ... | 5,300 | 9°15' | 23°38' | 202.4 | 331.3 | 350.9 | 718.3 | 738.0 | 84.2 | 37.4 | 42.3 | 113.0 | 28.4 | 108.9 | 186.0 | 2,341.1 |
| Mbeya | " | Musekera Estate | 3,800 | 9°15' | 33°38' | 199.5 | 203.6 | 326.1 | 642.0 | 682.3 | 96.4 | 23.7 | 17.1 | 30.2 | 26.7 | 55.4 | 86.6 | 2,349.6 |
| | " | Mbeya ... | 3,630 | 8°10' | 34°08' | 90.4 | 224.9 | 194.3 | 51.4 | 44.6 | 0.0 | 0.0 | 0.0 | 0.0 | 42.6 | 5.1 | 651.0 | 808.3 |
| | " | Madibira Mission | 5,200 | 8°34' | 35°43' | 28.4 | 179.3 | 116.3 | 42.4 | 2.8 | 0.0 | 0.0 | 0.0 | 0.0 | 5.6 | 40.1 | 69.3 | 484.2 |
| | " | Ngarube ... | 5,200 | 8°34' | 35°43' | 25.0 | 203.5 | 210.0 | 93.0 | 5.5 | 0.0 | 0.0 | 0.0 | 0.0 | 29.5 | 5.0 | 152.0 | 723.5 |
| " | Mbozi ... | — | — | — | 237.0 | 277.0 | 295.0 | 112.0 | 11.1 | 0.0 | 0.0 | 0.0 | 0.0 | 39.3 | 72.5 | 172.5 | 1,216.4 | |

APPENDIX VIII (B).—METEOROLOGICAL OBSERVATIONS, 1928.

Station: DAR ES SALAAM.

Longitude, 39° 40' E. Latitude, 6° 80' S. Altitude, 20 feet.

| Month | AIR TEMPERATURE (° CENTIGRADE) | | | | | | | | | | Wet Bulb | | Rainfall in millimetres | | Number of Days of rain |
|-----------|--------------------------------|------|------|------|----------|------|------------------------|--------------|------|------|----------------|------|-------------------------|------------------------|---------------------------|
| | Dry Bulb | | Mean | | Means of | | Absolute Max. and Min. | | Date | | In any one day | | Total for month | Day with rain. 0.2 mm. | |
| | | | | | | | | | | | 9 h | 14 h | | | |
| January | 29.5 | 30.5 | 28.9 | 32.0 | 25.7 | 34.0 | 23.0 | 10, 12 | 26.2 | 26.4 | 29.3 | 18.8 | 8 | 5 | |
| February | 29.8 | 31.2 | 29.5 | 32.9 | 26.1 | 35.0 | 22.5 | 6 | 26.0 | 26.1 | 1.3 | 3.5 | 24 | 2 | |
| March | 28.3 | 29.5 | 28.0 | 32.0 | 24.0 | 35.0 | 22.0 | 26 | 25.8 | 26.1 | 128.1 | 47.2 | 25 | 10 | |
| April | 26.4 | 27.6 | 26.5 | 29.5 | 23.4 | 32.5 | 22.5 | 5, 7, 20, 30 | 21.6 | 25.2 | 349.8 | 96.9 | 3 | 21 | |
| May | 25.2 | 27.7 | 25.6 | 29.1 | 22.0 | 32.0 | 20.5 | 20, 21, 24 | 22.8 | 23.4 | 161.1 | 52.2 | 3 | 15 | |
| June | 24.1 | 27.8 | 24.8 | 29.0 | 20.5 | 30.5 | 17.8 | 30 | 22.4 | 22.8 | 118.3 | 81.5 | 1 | 7 | |
| July | 22.7 | 27.1 | 23.8 | 28.3 | 18.2 | 29.8 | 16.2 | 2, 3 | 20.4 | 21.4 | 1.6 | 1.6 | 31 | 1 | |
| August | 24.0 | 27.1 | 21.0 | 28.6 | 19.4 | 31.0 | 17.0 | 5, 6 | 21.4 | 21.6 | 30.9 | 13.2 | 29 | 7 | |
| September | 25.5 | 27.6 | 24.6 | 28.9 | 20.2 | 31.0 | 18.8 | 20 | 22.5 | 23.1 | 17.1 | 12.1 | 5 | 7 | |
| October | 26.9 | 28.1 | 25.2 | 29.4 | 20.9 | 30.4 | 18.3 | 12 | 23.2 | 23.9 | 88.1 | 8.1 | 6 | 1 | |
| November | 27.0 | 28.4 | 26.1 | 29.8 | 22.4 | 31.3 | 21.2 | 1, 15 | 24.2 | 25.0 | 110.8 | 23.8 | 10 | 18 | |
| December | 29.4 | 30.2 | 28.6 | 32.0 | 25.2 | 34.1 | 22.0 | 1 | 25.5 | 25.7 | 18.0 | 3.4 | 7 | 12 | |

Station: MWANZA.

Longitude, 32° 53' E. Latitude, 3° 32' S. Altitude, 3,709 feet.

| Month | AIR TEMPERATURE (° CENTIGRADE) | | | | | | | | | | Wet Bulb | | Rainfall in millimetres Day with rain. 0.2 mm. | | Number of days of rain |
|-----------|--------------------------------|------|------|------|----------|------|------------------------|--------------------------|--------------------------------------|------|----------|--------------------|---|------|---------------------------|
| | Dry Bulb | | Mean | | Means of | | Absolute Max. and Min. | | | | | | | | |
| | | | 9 h | 14 h | Max. | Min. | Max. | Min. | Date | Min. | Date | | | | |
| | 9 h | 14 h | Max. | Min. | Max. | Min. | Date | Min. | Date | 9 h | 14 h | Total for month | Max. | Date | |
| January | 23.9 | 27.5 | 23.7 | 29.4 | 17.9 | 32.0 | 16.0 | 30 | 7, 11 | 22.9 | 27.3 | 56.5 | 25.2 | 10 | 5 |
| February | 23.2 | 27.6 | 24.0 | 29.1 | 18.9 | 32.0 | 15.0 | 9 | 7 | 22.0 | 26.6 | 70.0 | 23.7 | 17 | 8 |
| March | 22.9 | 27.6 | 23.4 | 28.7 | 18.1 | 32.0 | 14.0 | 16, 17, 18, 30 | 1 | 21.3 | 25.3 | 66.5 | 30.0 | 24 | 12 |
| April | 22.1 | 26.8 | 23.0 | 27.9 | 18.1 | 32.0 | 17.0 | 12 | 8, 15, 16, 17, 18, 21, 22, 23, 26 | 20.2 | 23.0 | 191.0 | 35.2 | 14 | 18 |
| May | 22.3 | 25.6 | 22.4 | 27.3 | 17.5 | 29.0 | 16.6 | 3, 14, 18, 19, 25, 26 | 9, 14, 18, 22 | 19.5 | 22.6 | 138.6 | 35.2 | 29 | 15 |
| June | 22.3 | 27.3 | 22.6 | 28.4 | 16.7 | 30.0 | 14.0 | 2, 26 | 9 | 19.6 | 24.7 | 2.1 | 1.2 | 3 | 4 |
| July | 21.4 | 27.1 | 21.8 | 28.0 | 15.6 | 31.0 | 11.0 | 23 | 5 | 19.1 | 24.3 | 29.5 | 29.5 | 30 | 1 |
| August | 21.9 | 26.8 | 22.8 | 28.3 | 17.3 | 31.0 | 15.0 | 22, 30 | 1, 5 | 21.0 | 25.2 | 31.5 | 31.5 | 11 | 1 |
| September | 24.0 | 27.6 | 23.9 | 29.4 | 18.3 | 32.0 | 16.0 | 4 | 14, 15, 30 | 21.7 | 25.2 | 41.7 | 38.1 | 30 | 5 |
| October | 23.7 | 27.5 | 23.5 | 28.5 | 18.5 | 31.0 | 16.0 | 7, 8, 12, 15, 17, 20, 22 | 5, 19 | 20.3 | 24.4 | 42.5 | 20.6 | 29 | 10 |
| November | 24.1 | 27.7 | 23.9 | 28.7 | 19.0 | 32.0 | 17.0 | 10, 11 | 10, 11 | 19.9 | 23.0 | 89.3 | 40.0 | 20 | 11 |
| December | 22.7 | 26.6 | 22.5 | 27.1 | 17.9 | 30.0 | 16.0 | 1, 3, 4, 5, 7 | 11, 12, 14 | 19.8 | 22.8 | 115.7 | 19.9 | 14 | 17 |

APPENDIX VIII (B).—METEOROLOGICAL OBSERVATIONS, 1928.—(contd.)

Station: ARUSHA. Longitude, 36° 43' E. Latitude, 3° 23' S. Altitude, 4,416 feet.

| Month | AIR TEMPERATURE (° CENTIGRADE) | | | | | | WET BULB | | Rainfall in millimetres | | Number of days of rain | | |
|-----------|--------------------------------|------|--------------------|------|------------------------|------|-----------------------|------|-----------------------------------|------|------------------------|-------|------|
| | Dry Bulb | | Means of | | Absolute Max. and Min. | | In any one day | | Day with rain = 0.2 mm. | | | | |
| | 9 h 14 h | | 3 Max. 4 Max. Min. | | Date | | 9 h 14 h | | Total for month | | | | |
| | 14 h | | Max. Min. | | Date | | 9 h 14 h | | Total for month | | | | |
| January | 20.0 | 26.2 | 20.5 | 27.4 | 13.6 | 30.0 | 27, 28, 29, 30, 31 | 12.0 | 14, 15, 24, 26, 28 | 33.2 | 19.5 | 15 | |
| February | 20.6 | 28.5 | 21.8 | 29.6 | 13.9 | 32.0 | 10 | 11.0 | 18.8 | 21.2 | 80.6 | 43.5 | 18 |
| March | 19.9 | 22.7 | 20.4 | 25.0 | 15.7 | 27.0 | 1, 16, 18, 20, 25, 31 | 12.0 | 1, 28 | 18.1 | 19.6 | 59.0 | 7 |
| April | 18.7 | 23.1 | 19.4 | 25.0 | 13.8 | 28.0 | 3, 9, 11 | 11.0 | 23 | 17.4 | 20.7 | 43.0 | 23 |
| May | 17.2 | 20.9 | 18.1 | 21.6 | 14.5 | 25.0 | 26, 28, 30 | 12.0 | 25, 26 | 16.1 | 19.6 | 245.7 | 4 |
| June | 15.6 | 19.1 | 17.0 | 20.5 | 13.4 | 23.0 | 20, 21 | 12.0 | 14, 18, 24, 25, 29, 30 | 15.2 | 17.8 | 91.5 | 2 |
| July | 13.8 | 18.1 | 15.4 | 19.8 | 11.0 | 21.0 | 16, 21 | 9.0 | 4, 5 | 12.7 | 16.9 | Nil | Nil |
| August | 13.9 | 19.7 | 16.0 | 20.5 | 11.4 | 23.0 | 20, 21 | 11.0 | 2, 5, 18, 27, 31 | 13.4 | 17.5 | 3.0 | 1.8 |
| September | 14.3 | 22.4 | 17.2 | 23.1 | 11.2 | 25.0 | 19, 30 | 11.0 | 1, 14, 18, 21, 22, 24, 27, 29, 30 | 14.2 | 18.5 | 4.8 | 2.2 |
| October | 15.7 | 25.0 | 19.0 | 25.6 | 12.4 | 27.0 | 3, 6, 8, 24, 27 | 11.0 | 1, 7, 11, 15 | 15.2 | 21.0 | 58.6 | 21.5 |
| November | 15.6 | 23.7 | 18.5 | 24.1 | 12.8 | 25.0 | 11, 18, 26, 30 | 12.0 | 4, 9, 16, 18, 19, 20, 28, 29 | 15.0 | 19.2 | 98.6 | 23.2 |
| December | 18.1 | 24.9 | 19.7 | 25.9 | 13.5 | 28.0 | 23, 27, 28 | 11.0 | 18 | 17.1 | 20.9 | 43.5 | 23.6 |

Station: AMANI.

| Station : AMANI. | | | | | | | | | | | | | | | | |
|------------------|-------------------------------|------|------|------|----------|------|------------|------|------|------|-------------------------|------|----------------|-------------------------|------|------------------------|
| Month | AIR TEMPERATURE (°CENTIGRADE) | | | | | | | | | | WET BULB | | | Rainfall in millimetres | | Number of days of rain |
| | Absolute Max. and Min. | | | | | | | | | | Day with rain = 0.2 mm. | | | Total for month | | |
| | Dry Bulb | | Mean | | Means of | | Date | | Min. | | Max. | | In any one day | | Date | |
| | 9 h | 14 h | Max. | Min. | Max. | Min. | Max. | Min. | 9 h | 14 h | 9 h | 14 h | Max. | | | |
| January | 22.0 | 25.3 | 21.9 | 26.0 | 17.7 | 27.5 | 22, 28, 30 | 15.0 | 20.5 | 21.4 | 56.9 | 27.6 | 8 | 15 | | |
| February | 22.6 | 26.6 | 22.8 | 27.6 | 17.9 | 29.5 | 19 | 15.0 | 20.5 | 21.6 | 3.5 | 2.5 | 15 | 3 | | |
| March | 22.5 | 25.4 | 22.2 | 26.4 | 18.0 | 28.0 | 1, 14, 16 | 15.5 | 21.0 | 21.8 | 298.3 | 60.4 | 5 | 21 | | |
| April | 21.5 | 23.1 | 21.2 | 24.4 | 18.0 | 27.0 | 11, 12 | 16.0 | 20.1 | 20.8 | 424.8 | 71.5 | 27 | 26 | | |
| May | 19.4 | 21.6 | 19.9 | 22.6 | 17.2 | 25.0 | 2, 25, 26 | 15.0 | 17.8 | 19.2 | 379.4 | 96.1 | 3 | 18 | | |
| June | 18.4 | 20.7 | 18.7 | 21.8 | 15.6 | 23.5 | 23 | 13.7 | 17.0 | 18.1 | 194.3 | 49.3 | 20 | 21 | | |
| July | 17.6 | 19.7 | 17.7 | 21.0 | 14.3 | 22.5 | 22 | 11.7 | 15.2 | 16.6 | 3.7 | 1.6 | 29 | 9 | | |
| August | 17.2 | 19.6 | 17.6 | 21.1 | 14.1 | 23.5 | 11 | 11.5 | 16.2 | 17.1 | 135.6 | 29.9 | 14 | 20 | | |
| September | 18.8 | 21.0 | 18.7 | 22.4 | 14.9 | 24.9 | 28 | 12.2 | 17.3 | 18.1 | 53.5 | 11.4 | 3 | 24 | | |
| October | 19.6 | 22.7 | 19.5 | 21.0 | 15.0 | 27.2 | 25 | 11.7 | 18.0 | 18.7 | 111.4 | 84.1 | 29 | 12 | | |
| November | 20.2 | 22.1 | 20.1 | 23.8 | 16.4 | 27.5 | 20 | 13.1 | 19.0 | 19.8 | 429.3 | 80.0 | 18 | 26 | | |
| December | 22.1 | 25.0 | 21.7 | 26.0 | 17.4 | 28.7 | 31 | 14.2 | 20.1 | 21.1 | 230.1 | 37.0 | 13 | 18 | | |

Longitude, 38° 38' E. Latitude, 5° 6' S. Altitude, 3,004 feet.

APPENDIX VIII (B).—METEOROLOGICAL OBSERVATIONS, 1928.—(contd.)

Station: KIGOMA. Longitude, 29° 38' E. Latitude, 4° 52' S. Altitude, 2,531 feet.

| Month | AIR TEMPERATURE (° CENTIGRADE) | | | | | Absolute Max. and Min. | | Wet Bulb | | Rainfall in millimetres | | Number of days with rain — 0.2 mm. | |
|-----------|--------------------------------|------|---------------------------|----------|--------------------------------------|------------------------|---|----------|-----|-------------------------|-----------------|------------------------------------|----------------|
| | Dry Bulb | | Mean | Means of | | Date | Min. | Max. | 9 h | 14 h | Total for month | | In any one day |
| | 9 h | 14 h | $\frac{1}{2}$ Max. + Min. | Max. | Min. | | | | | | | | |
| January | 25.4 | 29.8 | 21.0 | 35.0 | 11 | 19.0 | 47.9 | 27.0 | 29 | 6 | | | |
| February | 24.9 | 29.3 | 20.4 | 32.0 | 23 | 18.0 | 149.6 | 39.5 | 16 | 8 | | | |
| March | 24.1 | 29.1 | 19.0 | 31.0 | 19, 20, 31 | 18.0 | 72.5 | 10.0 | 25 | 1 | | | |
| April | 25.0 | 29.9 | 20.1 | 33.0 | 3 | 18.0 | 150.5 | 71.0 | 16 | 7 | | | |
| May | 25.1 | 29.7 | 20.4 | 31.0 | 14, 6, 7, 11, 13, 14, 18, 19, 20, 27 | 19.0 | 44.5 | 38.0 | 15 | 2 | | | |
| June | 24.6 | 29.6 | 19.5 | 31.0 | 2, 20, 22, 23, 26 | 18.0 | Nil | Nil | Nil | Nil | | | |
| July | 24.1 | 28.8 | 19.1 | 31.0 | 1 | 17.0 | 0 | 0 | 0 | 0 | | | |
| August | 25.2 | 30.0 | 20.1 | 32.0 | 24, 28, 29 | 18.0 | 0 | 0 | 0 | 0 | | | |
| September | 25.5 | 30.4 | 20.5 | 32.0 | 11, 13, 21, 25, 26, 30 | 19.0 | 5.5 | 3.5 | 29 | 1 | | | |
| October | 25.7 | 30.3 | 21.1 | 32.0 | 6, 8, 11, 18, 20, 22, 25 | 19.0 | 75.9 | 29.1 | 13 | 7 | | | |
| November | 24.8 | 29.1 | 20.4 | 32.0 | 5, 7, 21, 28 | 17.0 | 119.6 | 45.0 | 21 | 10 | | | |
| December | 24.0 | 28.0 | 20.0 | 30.0 | 15, 17, 19, 28, 30 | 19.0 | 2, 3, 5, 8, 9, 12, 13, 15, 19, 21, 22, 27 | | | | | | |

Station: MANYONI. Longitude, 34° 07' E. Latitude, 5° 39' S. Altitude, 4,135 feet.

| Station : MANYONLI. | | | | | | | | | | | | |
|---------------------|--------------------------------|------|------|------|------------------------|------|------------------|-----|-------------------------|-------|-------------------------------|------|
| Month | AIR TEMPERATURE (° CENTIGRADE) | | | | | | Wet Bulb | | Rainfall in millimetres | | | |
| | Dry Bulb | | Mean | | Absolute Max. and Min. | | | | Day with rain | | Number of days in any one day | |
| | 9 h | 14 h | Max. | Min. | Date | Min. | Date | 9 h | 14 h | | | |
| | | | | | | | | | | Max. | | Min. |
| January | 21.0 | 29.0 | 13.0 | 31.5 | 22, 23, 24, 25 | 11.0 | 3, 4, 5, 8, 14 | | | 69.0 | 32.0 | 25 |
| February | 21.6 | 28.4 | 14.8 | 31.0 | 1, 7, 8 | 11.0 | 2 | | | 56.9 | 26.5 | 17 |
| March | 21.2 | 27.4 | 15.0 | 29.0 | 9, 10, 20, 21, 29 | 12.0 | 28 | | | 135.7 | 39.1 | 25 |
| April | 21.8 | 27.0 | 15.6 | 30.0 | 15, 29, 30 | 13.0 | 20, 29 | | | 76.2 | 21.2 | 21 |
| May | 21.4 | 27.2 | 15.6 | 30.0 | 5 | 10.5 | 31 | | | 24.5 | 13.5 | 10 |
| June | 20.2 | 26.5 | 13.8 | 29.0 | 20 | 9.9 | 27, 29, 30 | | | Nil | Nil | Nil |
| July | 16.9 | 23.5 | 10.2 | 25.5 | 29 | 8.0 | 15, 19, 21 | | | 0 | 0 | 0 |
| August | 18.9 | 26.1 | 11.6 | 28.5 | 30 | 9.0 | 8, 9, 14, 15, 16 | | | 0 | 0 | 0 |
| September | 20.8 | 28.4 | 13.2 | 31.0 | 17, 18 | 10.0 | 18, 19 | | | 9.1 | 7.0 | 28 |
| October | 21.7 | 29.7 | 13.6 | 32.0 | 24, 26 | 10.0 | 6, 7, 8, 9 | | | Nil | Nil | Nil |
| November | 22.1 | 30.2 | 14.0 | 32.0 | 26, 27, 28 | 12.0 | 6, 16, 21, 23 | | | 227.9 | 47.0 | 20 |
| December | 22.2 | 28.6 | 15.7 | 31.5 | 7, 8, 9 | 14.0 | 2, 3, 24, 30 | | | | | 10 |

APPENDIX VIII (B).—METEOROLOGICAL OBSERVATIONS, 1928.—(contd.)

Station: MOSHI. Longitude, 37° 22' E Latitude 3° 22' S. Altitude, 2,649 feet.

| Month | AIR TEMPERATURE (° CENTIGRADE) | | | | | | | | | | WET BULB | | Rainfall in millimetres Day with rain = 0.2 mm. | | Number of days of rain | |
|-----------|--------------------------------|------|----------------|----------|------|------------------------|----------------|------|---------------|------|----------|-----------------|--|-------|------------------------|-----|
| | Dry Bulb | | Mean | Means of | | Absolute Max. and Min. | | | | 9 h | 14 h | Total for month | In any one day | | | |
| | 9 h | 14 h | ½ Max ÷ Min | Max. | Min. | Max. | Date | Min. | Date | | | | Max. | Date | | |
| | 9 h | 14 h | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Date | Max. | Date | | |
| January | 24.0 | 31.7 | 25.3 | 33.0 | 17.6 | 36.0 | 27 | 15.5 | 6, 24, 27, 30 | | 28.3 | 22.5 | 28.3 | 13.4 | 10.2 | 10 |
| February | 22.9 | 30.1 | 26.5 | 34.6 | 18.4 | 38.0 | 7 | 16.0 | 2 | | 20.2 | 20.2 | 27.0 | 8.4 | 3.9 | 17 |
| March | 22.5 | 27.2 | 25.1 | 31.5 | 18.6 | 35.0 | 21 | 16.5 | 12 | | 20.1 | 23.8 | 23.8 | 91.2 | 30.6 | 10 |
| April | 20.9 | 25.6 | 23.7 | 29.0 | 18.4 | 33.0 | 1, 2 | 15.0 | 14, 16, 17 | | 19.5 | 23.7 | 23.7 | 714.8 | 160.0 | 15 |
| May | 20.4 | 22.7 | 21.8 | 25.7 | 17.9 | 30.0 | 27 | 15.0 | 25 | | 18.9 | 20.5 | 20.5 | 167.6 | 55.0 | 2 |
| June | 18.6 | 22.2 | 20.2 | 24.1 | 16.2 | 28.0 | 20, 21 | 13.5 | 11, 22 | | 17.0 | 19.6 | 19.6 | 59.8 | 22.2 | 2 |
| July | 18.4 | 22.8 | 19.1 | 24.2 | 13.9 | 28.0 | 21 | 12.0 | 20, 23 | | 18.3 | 22.8 | 22.8 | Nil | Nil | Nil |
| August | 18.4 | 23.7 | 20.6 | 25.6 | 15.6 | 28.0 | 20, 21, 30, 31 | 10.0 | 5, 6 | | 18.5 | 24.6 | 24.6 | 18.5 | 14.5 | 30 |
| September | 19.8 | 26.3 | 22.3 | 28.6 | 15.9 | 31.0 | 26 | 12.0 | 24 | | 19.6 | 26.0 | 26.0 | 8.9 | 4.3 | 10 |
| October | 21.6 | 28.5 | 23.3 | 30.8 | 15.9 | 33.0 | 2, 25, 26, 27 | 12.0 | 6 | | 21.4 | 28.5 | 28.5 | 39.6 | 26.3 | 30 |
| November | 22.2 | 28.6 | 25.4 | 30.8 | 19.9 | 33.5 | 28 | 15.5 | 17 | | 21.0 | 27.0 | 27.0 | 55.0 | 13.5 | 4 |
| December | 23.2 | 28.8 | 24.4 | 31.2 | 17.5 | 34.0 | 23 | 15.0 | 23, 26 | | 20.1 | 22.2 | 22.2 | 26.9 | 10.2 | 5 |

Station: KILWA. Longitude, 39° 24' E. Latitude, 8° 57' S. Altitude, sea-level.

| Month | AIR TEMPERATURE (° CENTIGRADE) | | | | | | | | | | WET BULB | | Rainfall in millimetres | | Number of days of rain | |
|-----------|--------------------------------|------|------|------|----------|---------------------------------|------------------------|------------------|------|------------------|----------|------|-------------------------|----------------|------------------------|--|
| | Dry Bulb | | Mean | | Means of | | Absolute Max. and Min. | | | | 9 h | 14 h | Total for month | In any one day | | |
| | | | Max. | Min. | Max. | Min. | Date | Min. | Date | | | | | | | |
| | 9 h | 14 h | Max. | Min. | Max. | Min. | Max. | Min. | Date | Min. | Date | Max. | Date | | | |
| January | ... | 28.9 | 31.7 | 26.0 | 34.0 | 26 | 24.0 | 2 | 24.0 | 2 | 119.0 | 42.0 | 6 | 16 | | |
| February | ... | 28.2 | 31.3 | 25.1 | 33.0 | 15 | 22.0 | 29 | 23.0 | 29 | 106.6 | 27.3 | 19 | 13 | | |
| March | ... | 28.0 | 31.4 | 24.5 | 32.5 | 20 | 23.0 | 1, 3, 16 | 23.0 | 1, 3, 16 | 125.3 | 18.0 | 31 | 13 | | |
| April | ... | 27.5 | 31.2 | 23.8 | 32.0 | 2, 5, 9, 11, 16, 18, 22, 24, 28 | 22.0 | 24 | 22.0 | 24 | 186.0 | 38.9 | 22 | 17 | | |
| May | ... | 26.3 | 29.8 | 22.7 | 33.0 | 26 | 20.0 | 19, 30 | 20.0 | 19, 30 | 59.7 | 59.5 | 14 | 6 | | |
| June | ... | 25.5 | 29.6 | 21.3 | 31.0 | 26 | 18.0 | 28, 29, 30 | 18.0 | 28, 29, 30 | 59.7 | 59.5 | 22 | 2 | | |
| July | ... | 23.9 | 28.7 | 19.0 | 30.0 | 2, 3, 5, 10, 16, 17, 23 | 16.0 | 1 | 16.0 | 1 | Nil | Nil | 1.8 | Nil | | |
| August | ... | 24.8 | 28.7 | 20.8 | 30.0 | 1, 19, 22 | 18.0 | 6 | 18.0 | 6 | 5.4 | 5.4 | 28 | 1 | | |
| September | ... | 26.0 | 29.1 | 22.9 | 30.0 | 5, 12, 17, 19, 21, 26, 28 | 21.0 | 4, 9, 11, 20, 21 | 21.0 | 4, 9, 11, 20, 21 | 19.1 | 15.5 | 9 | 3 | | |
| October | ... | 26.6 | 29.4 | 23.8 | 30.0 | 1.5, 7, 10, 14, 21, 31 | 20.0 | 5 | 20.0 | 5 | 8.0 | 8.0 | 30 | 1 | | |
| November | ... | 27.3 | 29.4 | 24.9 | 31.0 | 11 | 21.0 | 16 | 21.0 | 16 | 62.1 | 57.0 | 16 | 3 | | |
| December | ... | 27.9 | 30.3 | 25.4 | 32.0 | 7 | 22.0 | 15 | 22.0 | 15 | 47.2 | 25.5 | 10 | 6 | | |

APPENDIX VIII (c).

TANGANYIKA TERRITORY.—RAINFALL AVERAGES.

(IN MILLIMETRES) TO END OF 1928.

| Province | METEOROLOGICAL STATION | Alt. Feet | Lat. S. | Long. E. | Number of years German Records | Total Number of years of records | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total | Highest Annual Rainfall | Lowest Annual Rainfall |
|----------|------------------------|-----------|---------|----------|--------------------------------|----------------------------------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|---------|-------------------------|------------------------|
| Northern | Arusha ... | 4,416 | 3°23' | 36°43' | — | 7 | 50.2 | 99.8 | 154.1 | 321.1 | 165.9 | 41.8 | 9.7 | 12.9 | 15.9 | 42.5 | 130.2 | 78.0 | 1,122.1 | 1,222.5 | 959.7 |
| | Mbulu ... | 5,900 | 3 52 | 35 37 | 3 | 10 | 93.1 | 85.9 | 165.6 | 167.6 | 59.5 | 4.9 | 1.0 | 1.8 | 4.9 | 20.9 | 78.7 | 101.9 | 785.8 | 1,217.0 | 594.0 |
| | Moshi ... | 2,649 | 3 22 | 37 22 | 12 | 20 | 33.1 | 50.5 | 108.3 | 344.0 | 242.1 | 44.6 | 35.0 | 21.1 | 16.4 | 26.9 | 72.9 | 46.0 | 1,040.9 | 1,204.1 | 470.0 |
| | Kilema Mission | 4,703 | 3 19 | 37 29 | — | 4 | 111.6 | 68.3 | 310.8 | 414.2 | 216.8 | 76.5 | 34.2 | 73.6 | 59.6 | 92.9 | 188.8 | 182.1 | 1,829.4 | 2,044.8 | 1,744.7 |
| Tanga | Mweka Estate ... | 3,850 | 3 17 | 37 19 | — | 4 | 35.1 | 14.9 | 146.3 | 375.9 | 329.9 | 74.2 | 37.3 | 46.3 | 10.6 | 42.2 | 76.7 | 61.9 | 1,251.3 | 1,699.5 | 769.2 |
| | Tanga ... | S.L. | 5 40 | 39 07 | 18 | 26 | 40.2 | 48.4 | 107.5 | 293.2 | 325.3 | 71.0 | 93.5 | 79.0 | 81.3 | 112.4 | 190.3 | 62.7 | 1,504.8 | 2,237.1 | 1,113.8 |
| | Amani ... | 3,004 | 3 06 | 38 38 | 10 | 18 | 89.6 | 70.2 | 157.5 | 390.8 | 342.1 | 115.2 | 104.6 | 97.6 | 99.6 | 180.5 | 217.7 | 168.8 | 2,034.2 | 2,486.1 | 1,560.2 |
| | Lushoto ... | 4,590 | 4 48 | 38 18 | 10 | 18 | 74.3 | 81.6 | 125.0 | 240.3 | 229.6 | 51.2 | 43.6 | 16.5 | 12.1 | 35.2 | 101.7 | 112.8 | 1,123.9 | 1,451.4 | 968.6 |
| Eastern | Sakare Cottage | 4,500 | 5 00 | 38 05 | 8 | 14 | 80.7 | 77.7 | 105.7 | 369.5 | 553.4 | 131.8 | 124.4 | 75.5 | 57.5 | 105.4 | 112.7 | 84.0 | 1,878.3 | 1,893.6 | 1,584.1 |
| | Pangani ... | S.L. | 5 25 | 38 58 | 12 | 19 | 46.9 | 26.8 | 100.7 | 174.6 | 217.4 | 49.6 | 63.2 | 42.3 | 36.6 | 76.6 | 133.3 | 72.7 | 1,040.7 | 1,576.8 | 79.8 |
| | Dar es Salaam ... | 30 | 6 50 | 39 17 | 19 | 26 | 74.2 | 52.9 | 126.0 | 280.1 | 174.1 | 33.6 | 37.1 | 25.8 | 29.3 | 37.9 | 76.7 | 93.8 | 1,041.5 | 1,297.9 | 591.0 |
| | Msimbazi Mission | 30 | 6 50 | 39 17 | — | 4 | 24.0 | 27.2 | 139.3 | 264.9 | 111.1 | 50.3 | 2.2 | 5.0 | 7.9 | 74.9 | 119.2 | 73.0 | 899.0 | 1,051.3 | 758.9 |
| | Bagamoyo ... | S.L. | 6 25 | 38 55 | — | 7 | 84.6 | 53.4 | 103.0 | 240.0 | 170.1 | 36.1 | 32.0 | 29.0 | 27.4 | 39.8 | 92.5 | 108.4 | 1,016.3 | 1,260.5 | 748.1 |
| | Utete ... | 327 | 8 00 | 38 45 | — | 7 | 82.8 | 73.1 | 154.2 | 140.6 | 55.8 | 12.0 | 1.8 | 0.0 | 14.6 | 23.3 | 94.9 | 46.8 | 699.9 | 779.3 | 580.8 |
| | Mpanganya ... | 105 | 8 05 | 38 40 | 5 | 9 | 124.0 | 68.7 | 164.9 | 239.3 | 57.8 | 2.1 | 2.8 | 6.6 | 14.0 | 22.3 | 68.8 | 65.1 | 836.4 | 1,120.7 | 747.5 |
| | Morogoro ... | 1,628 | 6 48 | 37 46 | 7 | 13 | 93.8 | 90.9 | 185.8 | 227.4 | 85.2 | 35.4 | 19.6 | 10.0 | 22.1 | 28.2 | 41.4 | 99.6 | 888.4 | 1,045.8 | 781.4 |
| | Kilosa ... | 1,606 | 6 48 | 37 01 | 12 | 18 | 135.0 | 134.9 | 137.0 | 173.7 | 62.8 | 12.6 | 13.2 | 14.9 | 16.4 | 23.9 | 64.4 | 99.6 | 888.4 | 1,045.8 | 781.4 |
| | Ngerengere ... | 641 | 6 47 | 38 08 | — | 7 | 56.0 | 111.1 | 115.3 | 190.2 | 107.4 | 29.7 | 6.3 | 18.0 | 44.3 | 52.4 | 89.0 | 75.8 | 895.5 | 1,370.4 | 737.2 |
| | Soga ... | 508 | — | — | — | 4 | 132.5 | 63.1 | 192.4 | 270.8 | 77.5 | 24.2 | 1.4 | 8.3 | 37.8 | 57.2 | 127.0 | 97.4 | 1,089.6 | 1,236.5 | 897.1 |
| | Ruvu Estate ... | — | 6 48 | 38 45 | — | 4 | 91.9 | 56.2 | 112.5 | 187.2 | 119.5 | 21.3 | 7.1 | 11.2 | 51.5 | 88.6 | 130.8 | 83.7 | 961.5 | 1,120.2 | 837.6 |
| Lindi | Lindi ... | S.L. | 10 00 | 39 43 | 14 | 20 | 195.0 | 139.0 | 164.5 | 188.5 | 42.0 | 6.8 | 3.8 | 5.6 | 7.9 | 19.5 | 74.2 | 180.6 | 1,027.4 | 1,058.4 | 641.1 |
| | Tunduru ... | 2,300 | 11 05 | 37 27 | — | 7 | 228.6 | 188.3 | 170.2 | 67.4 | 15.3 | 1.1 | 1.0 | 25.7 | 1.1 | 15.1 | 27.3 | 117.1 | 858.2 | 1,227.6 | 549.1 |
| | Masasi Mission | 1,505 | 10 42 | 38 53 | 4 | 11 | 255.0 | 233.0 | 263.9 | 141.2 | 28.5 | 2.7 | 2.6 | 5.1 | 10.5 | 13.9 | 62.0 | 195.5 | 1,153.9 | 1,221.6 | 637.0 |
| | Ndanda Mission | 934 | 10 28 | 39 04 | — | 4 | 198.8 | 122.8 | 243.3 | 246.0 | 74.5 | 11.5 | 0.0 | 14.3 | 81.6 | 26.8 | 210.9 | 237.9 | 1,468.4 | 1,737.0 | 1,100.6 |
| | Mikindani ... | 40 | 10 16 | 40 07 | 10 | 13 | 180.8 | 116.7 | 146.1 | 163.7 | 51.0 | 7.9 | 11.9 | 7.8 | 12.9 | 13.1 | 45.6 | 191.7 | 949.2 | 1,424.3 | 752.4 |
| | Kilwa ... | S.L. | 8 44 | 39 25 | 14 | 21 | 129.8 | 106.3 | 150.6 | 205.6 | 60.2 | 8.7 | 8.8 | 11.1 | 14.7 | 15.8 | 49.9 | 111.7 | 873.2 | 1,036.0 | 470.2 |
| | Liwale ... | 1,500 | 9 45 | 38 00 | — | 7 | 178.0 | 227.7 | 141.5 | 75.1 | 30.8 | 0.2 | 0.4 | 3.3 | 3.9 | 15.9 | 43.2 | 139.8 | 859.8 | 1,229.8 | 502.7 |
| | Kibata ... | 1,400 | 8 50 | 39 00 | 4 | 8 | 227.9 | 93.9 | 134.1 | 255.6 | 60.1 | 13.4 | 8.1 | 14.2 | 55.5 | 27.4 | 258.9 | 183.9 | 1,333.0 | 900.6 | 587.9 |
| Central | Dodoma ... | 3,693 | 6 11 | 35 46 | — | 7 | 123.6 | 98.7 | 64.9 | 55.3 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 6.2 | 12.0 | 118.2 | 480.0 | 722.5 | 220.8 |
| | Mpwapwa ... | — | — | — | — | 3 | 151.3 | 121.9 | 82.8 | 95.3 | 25.8 | 1.0 | 0.0 | 0.9 | 3.6 | 10.0 | 14.6 | 134.7 | 641.9 | 941.7 | 502.2 |
| | Buigiri ... | 3,000 | 6 00 | 36 00 | — | 4 | 179.3 | 84.1 | 57.0 | 14.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 15.8 | 126.3 | 486.6 | 584.2 | 425.9 |
| | Manyoni ... | 4,135 | 5 39 | 34 07 | — | 6 | 148.6 | 94.8 | 128.7 | 105.6 | 8.3 | 0.4 | 0.0 | 0.0 | 0.7 | 7.1 | 49.8 | 143.3 | 687.3 | 875.9 | 332.6 |
| | Singida ... | 5,233 | 4 48 | 34 45 | 3 | 9 | 113.9 | 102.4 | 118.9 | 45.0 | 3.6 | 0.5 | 0.0 | 0.0 | 0.0 | 11.9 | 32.6 | 126.9 | 555.7 | 749.6 | 495.0 |
| | Mvumi Mission | 3,500 | 5 00 | 35 00 | — | 4 | 116.9 | 75.9 | 69.2 | 33.3 | 7.6 | 0.0 | 0.0 | 0.0 | 0.0 | 6.7 | 21.1 | 129.8 | 460.5 | 532.1 | 340.0 |
| | Kondoa-Irangi ... | 4,610 | 4 57 | 35 35 | 9 | 15 | 101.0 | 89.2 | 102.1 | 71.8 | 13.3 | 0.8 | 0.0 | 0.0 | 1.0 | 5.4 | 29.2 | 101.8 | 515.6 | 621.1 | 281.1 |
| | Mkalama ... | 4,235 | 4 06 | 34 38 | 4 | 11 | 88.1 | 94.5 | 139.0 | 104.2 | 29.0 | 1.4 | 1.5 | 1.6 | 3.7 | 17.3 | 72.6 | 117.9 | 670.8 | 1,101.9 | 520.0 |
| Tabora | Mkalama ... | 4,235 | 4 06 | 34 38 | 4 | 11 | 88.1 | 94.5 | 139.0 | 104.2 | 29.0 | 1.4 | 1.5 | 1.6 | 3.7 | 17.3 | 72.6 | 117.9 | 670.8 | 1,101.9 | 520.0 |
| | Tabora ... | 4,000 | 5 00 | 32 00 | 14 | 20 | 130.1 | 122.1 | 165.2 | 136.4 | 16.2 | 2.5 | 0.0 | 0.5 | 7.6 | 14.5 | 102.6 | 139.2 | 836.9 | 1,303.4 | 546.0 |
| | Kahama ... | 4,055 | 3 35 | 32 33 | — | 7 | 125.3 | 123.3 | 190.9 | 140.4 | 31.7 | 4.3 | 2.8 | 0.5 | 7.2 | 44.4 | 98.7 | 150.4 | 919.9 | 1,170.9 | 739.3 |
| | Ushirombo ... | — | — | — | — | 4 | 125.6 | 165.9 | 211.4 | 173.8 | 51.3 | 29.1 | 2.1 | 7.5 | 37.3 | 81.2 | 128.7 | 140.3 | 1,154.2 | 1,123.1 | 819.0 |
| | Kola Ndota Mission | 4,400 | 3 34 | 33 19 | — | 6 | 98.0 | 87.3 | 155.0 | 136.6 | 36.1 | 2.9 | 0.9 | 0.3 | 10.7 | 28.6 | 89.7 | 124.7 | 770.8 | 892.7 | 541.0 |
| | Lohombo Mission | 4,400 | 4 00 | 33 19 | — | 3 | 95.0 | 109.5 | 178.1 | 193.6 | 37.3 | 0.5 | 9.7 | 0.0 | 23.1 | 42.6 | 51.7 | 136.5 | 877.6 | 948.6 | 772.5 |
| | Nzega ... | 4,000 | 4 15 | 33 08 | — | 4 | 105.9 | 98.0 | 155.6 | 109.3 | 29.0 | 0.4 | 6.5 | 3.3 | 10.6 | 33.7 | 131.8 | 157.4 | 841.5 | 974.7 | 619.1 |
| | Kigoma ... | 2,531 | 4 52 | 29 38 | — | 7 | 109.4 | 124.7 | 104.0 | 108.8 | 47.7 | 13.3 | 2.7 | 2.3 | 17.7 | 29.1 | 123.5 | 157.0 | 840.2 | 1,165.4 | 482.8 |
| Kigoma | Kigoma ... | 2,531 | 4 52 | 29 38 | — | 7 | 109.4 | 124.7 | 104.0 | 108.8 | 47.7 | 13.3 | 2.7 | 2.3 | 17.7 | 29.1 | 123.5 | 157.0 | 840.2 | 1,165.4 | 482.8 |
| | Ujiji ... | 2,738 | 4 59 | 29 47 | 9 | 16 | 110.4 | 129.1 | 132.1 | 146.1 | 49.2 | 6.2 | 6.9 | 2.9 | 10.7 | 38.5 | 109.1 | 143.8 | 885.0 | 1,200.3 | 665.6 |
| | Kasulu ... | 4,530 | 4 35 | 30 07 | — | 7 | 160.2 | 175.2 | 164.9 | 206.4 | 64.4 | 5.4 | 0.1 | 5.7 | 24.9 | 76.6 | 108.6 | 168.2 | 1,160.6 | 1,329.1 | 1,092.8 |
| | Iringa ... | 5,365 | 7 47 | 35 37 | 5 | 11 | 141.6 | 114.4 | 172.8 | 81.7 | 5.9 | 0.8 | 0.1 | 0.0 | 0.8 | 6.6 | 37.4 | 112.8 | 674.9 | 922.9 | 524.7 |
| Iringa | Iringa ... | 5,365 | 7 47 | | | | | | | | | | | | | | | | | | |

